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# PATHOLOGICAL SOCIETY

FOR THE YEAR 1890



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PRESENTATION OF PORTRAITS

OF

DRS. LEWIS A. SAYRE

MIDDLETON GOLDSMITH

AND

JOHN C. PETERS

FOUNDERS OF THE

NEW YORK PATHOLOGICAL SOCIETY

JANUARY 15TH, 1890

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ADDRESS BY

DR. W. P. NORTHRUP



## PRESENTATION ADDRESS.

*Mr. President, Members of the Pathological Society and of the Profession.*

In the early forties, three signs were hung upon three house fronts of Broadway in the vicinity of Spring street.

The sign upon the corner house read, Dr. L. A. Sayre; three doors below was M. Goldsmith, M.D.; and directly across the street was Dr. John C. Peters.

During a week's visit to Boston, Dr. Goldsmith visited, with a friend, the Society for Medical Improvement, a society combining pathological with clinical studies. On his return home he hastened across the street to Dr. Peters' office to suggest the formation of such a society in New York.

Meantime young Sayre, having gained favor with the political coroner, who was also an undertaker and had a shop near by, was, with the consent of the coroner, cutting away at all cadavers labelled "drunk," or "drowned," or "stabbed," that found their way to the city's dead-house, located at that time on the corner of Chambers and Centre streets.

Dr. Peters, the third of this company of young physicians, fresh from study under Rokitansky, was busy translating an early volume of his teacher's work on pathology.

Into such inflammable material, then, fell the Boston spark. "Let us form such a society in New York," said Goldsmith. "Make it pathology alone," answered Peters and Sayre. A few older men were consulted on the advisability of starting such a society, but they only wagged their heads and said the like had been tried before.

While our three young men are busy working up their scheme for the first meeting, let us take a hasty look at the medical field about them. In the first place, the City of New York ended at Fourteenth street. Broadway was paved only as far as Tenth Street. The wealthy families lived about Bowling Green and along Broadway, upon Bond and Bleecker Streets, Park place, and St. John's Park.

Our young men touched their hats with great deference to the great medical lights, Dr. John A. Swett and Dr. H. D. Bulkley.

Alonzo Clark and Cammann were busy at auscultatory percus-

sion. Willard Parker was a young professor of surgery in the only medical college in New York ; Dr. Francis was lecturing on general practice ; Dr. Frank Johnson was the great light of the New York Hospital.

Joseph Mather Smith lectured on theory and practice, Delafield on obstetrics, and John Romeyn Beck on materia medica.

In surgery there were great names sounding in the ears of our young men : John Kearney Rogers, Valentine Mott, John C. Cheeseman, Richard K. Hoffmann, Gurdon Buck, John Watson.

At this time New York had one college, one hospital, and three dispensaries.

Our three young physicians no doubt came quite late from Sayre's office, on several evenings, and smelled very strong of tobacco smoke—but, at any rate, the plans were soon completed for the first meeting, the constitution was drawn up, by-laws written out in full ; and the morning mail brought to some of their friends a note asking them to assemble at Sayre's office at four o'clock, in the following afternoon, on "special business."

John A. Swett had given the secret away when he said such societies die by the time the constitution and by-laws are framed and the offices distributed.

Our young men had caught the cue, and when Dr. Sayre, at four o'clock, reached out his hand to welcome the first arrivals to the meeting, the elaborate documents, quite complete protruded from his inner coat pocket. Goldsmith was there, helping entertain the men as they arrived, appearing, no doubt, to wonder what it was all about. At last, bringing up in the rear, came Peters, with a most innocent look upon his face, carrying *two huge, mysterious-looking pails*.

The meeting was called to order, and the announcement made that a pathological society was to be formed ; a committee was appointed to draft constitution and by-laws, and directed to repair immediately to the rear room. Upon this committee were Sayre and Goldsmith.

The committee estimated that about three cigar-lengths of time would be a fair allowance for a rough draft of such papers, and that, having told the newest stories, they would easily pass the time and report in good form.

When they finally gathered up their crisp, neatly copied documents, flung open the sliding doors, and sallied forth, expecting to find themselves quite important in the meeting, what did they find ? Dr. Peters still digging among the contents of the two pails, and the whole company gathered about him, scrutinizing his beautiful types of "rum livers," "rum stomachs," perforated intestines, tuberculous lungs, cancerous tumors, etc.

It was getting dark, and lights were brought in. Still Peters



dug and the company stayed. The meeting was prolonged by questions and discussions, and no end of examination of the many wonderful pathological specimens.

As for the report of the committee, it found no opportunity for a hearing for several hours.

Such was the origin of the earliest Pathological Society, and such the success of its first meeting.

It is said that Dr. Swett presided at one meeting and never came again. The first elected president was Willard Parker.

The meeting just described occurred on June 14th, 1844, and there were present : Drs. Goldsmith, Peters, Sayre, Parker, W. C. Roberts, G. A. Sabine, James Crane, Philip Young, Israel Moses, and Macnevin—ten in number.

Dr. Goldsmith is described as “a tall man, considerably over six feet, muscular and exceedingly well proportioned ; quick, easy, and graceful, with a handsome, pleasant face ; neat, even showy, in dress.”

To all here present the physical characteristics of Drs. Sayre and Peters are familiar ; and it is not difficult for us to picture to our minds the founders of this Society surprising their friends with “special business” at *four o'clock* : the quiet, enthusiastic, earnest Dr. Peters; the towering, handsome Dr. Goldsmith; the roaring, irresistible Lewis A. Sayre !

These men said, We will organize a society, and forthwith it was started and at once became a success.

We have been looking back forty-five years. To-night the old landmarks are mostly gone; the city has overflowed its insular limits; successive groups of great medical and surgical lights have arisen and passed away; medical colleges have grown up, dispensaries multiplied, and New York no longer admits that Philadelphia is the one great medical centre of America.

What has become of our three young enthusiasts in pathological work, the founders of this Society ?

A star marks the name of one upon our membership list. This lectureship—the bequest—memorializes for all time the enduring interest which possessed the mind of Middleton Goldsmith.

Two members survive. We need not ask what marks their interest. Dr. Peters has been for many years—I dare not venture to say how many—twenty, perhaps, or more—editor of the Society’s “Transactions.” No one here can possibly be made to understand the hours and weeks of time he has put upon that work. For years he has been upon the Committee of Admission and Ethics. During the term of my service as President, it has been a pleasure and an inspiration to have before me a man who appeared at the earliest gatherings of this Society, has been identified with its workings from that time to the present, who has looked upon and who came in

contact with the great men of our profession in a past generation. To-night, in his son's home on Long Island, too feeble to be present with us, he watches the hours as they pass, and when the time for adjournment of this meeting shall have struck he will say, "This is the first I have ever missed."

Dr. Sayre can remember no early experiences more vividly than those in the early days of the Pathological Society, and can rouse himself from feebleness no more effectually than when he recalls that first meeting and the incidents of the constitution and by-laws. He hoped to meet us here to-night, but he is a cripple, is enfeebled by sickness, and at last broken beneath a sudden and heavy sorrow.

Mr. President, the three portraits before you are gifts from Dr. Sayre, Dr. Peters, and the daughters of Middleton Goldsmith, tokens expressing to you approval and pride in the success and records of the Society of which you are the chief officer. They enjoin upon you the furthering of the good work as best fits and becomes the times and advancement of pathological investigations.

To the Society they stand, and shall stand, as a pleasant greeting, and mutely bid you accept the best wishes of the donors, and God-speed.

In the name of Lewis A. Sayre, John C. Peters, and the daughters of Middleton Goldsmith, I formally present these three portraits, severally, to the corporate body, the New York Pathological Society, to be held as property by its trustees forever.

# MIDDLETON GOLDSMITH LECTURE

BY

WILLIAM PEPPER, M.D., LL.D.

PROVOST OF THE UNIVERSITY OF PENNSYLVANIA

## HEPATIC FEVER





## HEPATIC FEVER.

---

*Mr. President and Members of the New York Pathological Society.*

Your President's kind introduction adds to the embarrassment which I confess to have felt in endeavoring to select some subject which might more or less worthily occupy the attention of such a body; in casting about for such a subject, I found much difficulty, and that which I finally choose will probably be regarded as scarcely appropriate. It is not wholly pathological, but partly clinical in its interest. The very name "hepatic fever" may seem more or less a misnomer. We meet with so many affections of the liver attended with fever that it would be impossible to place in one group all to which this name might in one sense be applied.

It is true that, without calling in the assistance of our willing brethren the laparotomists, we are at times unable to make an exact differential diagnosis, and are still forced to name the affection by the most prominent symptom. And I am sure you have all met with cases of lesion of the liver or of its ducts, attended with fever of the peculiar type I wish to describe, and in which the determination of the exact seat and kind of the lesion was difficult or impossible. I do not intend to speak of the more ordinary fever which attends many acute hepatic affections, which is merely a more or less severe continued febrile movement with moderate fluctuations. We note this, for instance, in acute catarrhal jaundice, or for a few days following the passage of a gall stone. Nor do I now include that very interesting affection known as Weil's disease, of which, I believe, I have seen three cases, although only in one have I a full clinical and pathological record. What I shall say is based on a study of twenty-one cases where fever of a peculiar paroxysmal character appeared in connection with various hepatic lesions. It may either be a quotidian, a tertian, or a quartan; and I have even seen a double quotidian type. It is a distinctly paroxysmal fever, often ushered in by a violent chill shaking the whole body of the patient. Sometimes there is only a slight rigor; sometimes even it comes on without any perceptible sensation of cold at all. This is followed by an unusually rapid rise of tempera-

ture, reaching as high a point even as  $103^{\circ}$ ,  $104^{\circ}$ , or  $105^{\circ}$ , attended with distress, restlessness, thirst, more or less pain through the frame, and not rarely with vomiting; lasting for a few hours—from four or five to as many as ten or twelve—and terminating by a sweat, sometimes merely a moisture, sometimes a drenching sweat soaking the clothing of the patient and bed. This fever may be repeated, as I have said, at quotidian, tertian, or quartan intervals; a single paroxysm may close it, or there may be successive paroxysms, the intervals being sometimes regular and sometimes wholly irregular, amounting to days, weeks, or even months before another attack appears. After each paroxysm jaundice makes its appearance, as a rule; but sometimes it is only slight, or may even be absent, with at most a little yellowish discoloration of the conjunctiva and some darkening of the urine for a short time. In the majority of cases, however, the jaundice is decided, and may be intense, lasting for varying periods, sometimes days, sometimes several weeks, before passing away. At the moment of the occurrence of such a paroxysmal fever there may or may not be severe hepatic pain. This pain may be wholly absent, and yet a hard chill, high fever, profuse sweat, and deep jaundice follow. Or there may be pain so severe that it forces the belief that a calculus is engaged in one of the ducts, the pain requiring hypodermic injections of morphine for its relief.

In bad cases, where such paroxysms occur, you can easily understand that the general health of the patient suffers severely. Anæmia is developed; there is marked loss of flesh; the digestive processes are impaired; and we find these paroxysms recurring with greater and greater facility. In fact, in this type of hepatic fever an unfavorable prognosis often has to be made, and many such cases go on to a fatal result after a course of variable duration. But it is far from being always fatal, and in a certain number of cases—it has been my own good fortune to see quite a number of them—after having from fifty to one hundred paroxysms, complete recovery occurs, without anything to signalize the termination of the process—no morbid discharge, nor passage of a calculus, but a gradual subsidence of the morbid condition itself.

It is to this type of fever, paroxysmal and intermittent as a rule, with paroxysms occurring sometimes closely together, with a certain amount of febrile action kept up between them, that I would ask your attention this evening.

It is not in connection with the liver alone that we meet with fever of this type; I shall later ask attention to the resemblance existing between this and urethral fever, where we find, in connection with certain morbid states of the urinary tract, febrile paroxysms having considerable analogy with those already described.

In trying to understand a febrile process of this kind, it is clear

that we must have in view the general causation of fever, and I take it that we are all agreed to-day that fever comes very often as a septic process from absorption into the system of some morbid, pyrogenic, poisonous substance; and, secondly, that fever is caused by a disorder of the nervous apparatus controlling heat production and dissipation, and that this disorder may either be centric directly or may be induced by reflex irritation from some local disease. The reality of this last cause of fever, I think, may be demonstrated by the interesting physiological experiments which my distinguished friend, Dr. H. A. Hare, is bringing to a conclusion in the laboratory of the University of Pennsylvania, which show that a lesion which engenders fever will not do so provided all the nerve trunks of the limb be severed; in other words, that in certain cases we must recognize as a cause the existence of a local lesion acting upon the heat-controlling mechanism at the centre in a reflex manner.

When we come to apply these general thoughts upon fever to the subject of fever connected with the liver, we would expect, I think, from the known antiseptic properties of the bile, to find certain difficulties in the development of fever; whereas, on the contrary, it seems to me, clinically, that there is no organ in connection with which we find more violent explosions of fever than we do in the case of the liver. It is very certain, however, that the entrance of bile into the blood cannot be brought into account to explain the production of fever. The injection of the entire bile or the injection of bile salts, both lower temperature, slow the pulse, and slow breathing, but do not create fever at all. Again, bile may lie for a long time, even for weeks, in an obstructed duct, and undergo no morbid change which makes it pyrogenic. It is perfectly true that the bile, a highly complex liquid, is singularly prone to undergo chemical change; bilirubin becomes converted into biliverdin in the easiest manner possible. But this is a chemical change, and is not one attended with the development of septic principles: so that the bile may remain a long time in the obstructed dilated ducts without undergoing changes rendering it capable of producing septic processes or pyrexia.

It seems then necessary, in these cases, that we should recognize the existence of additional elements; that there should be mixture with the bile of morbid discharges from the mucous membrane of the ducts; and it is very clear that this could be brought about in almost any case very readily. Thus, for instance, the passage of a gall stone frequently leaves a laceration of the mucous membrane. We have, then, at once an abrasion, a source of morbid discharge and admixture with the bile of putrefactive matter, and this may be sufficiently considerable in amount to alter the character of the bile and start a septic process.

Or, again, this same lesion serves as the starting point of reflex

irritation, to disorder the heat-controlling mechanism. Note, in connection with this, that most of the cases we are discussing are attended with more or less obstruction of the ducts of the liver, and think how often it is, in studying our cases of liver disease, that we recognize the existence of such obstruction. Now, when the ducts of the liver are obstructed and distended with accumulated bile, not only is the bile absorbed into the lymphatics if the pressure goes beyond a certain point, causing absorption jaundice, but this pressure upon the hepatic tissue about the distended ducts interferes powerfully with the functional activity of the liver.

The bile-secreting function of the liver is certainly far from being its only important function. I doubt not we have yet to learn of new functions of essential value; but there is one we already know enough about to assert that it is of immense importance, and, so far as the production of disease is concerned, of even greater importance than the bile-secreting function, *i.e.*, the ptomaine-destroying function of the liver.

The liver, then, possesses this extraordinary power of arresting pyrogenic substances, such as the albumoses, whether hemi- or deutero-albumose, as they are passing into the system from the intestinal canal, and of destroying their morbid properties. So that, granting the functional activity of the liver, these pyrogenic substances are not able to penetrate the system and generate pyrexia.

If you have a condition of the liver where the bile ducts are distended with accumulated bile, not only, I say, does jaundice occur, but inevitably we shall have this important ptomaine-destroying function of the liver more or less paralyzed, and there will pass on into the system, on account of this arrest of the functional activity of the liver, pyrogenic and poisonous substances which may be responsible for the fever and other symptoms which subsequently develop.

The mere absence of bile from the intestine in cases of occlusion, even though it be a complete absence, is not immediately disastrous, provided the diet of the patient is carefully regulated, and especially if fats be excluded; for, in the absence of bile, the fats break up rapidly into highly injurious derivatives in the intestines.

Thus I may quote the case (No. 1) of William McF., a man aged sixty-five years, who was admitted to the medical ward of the Philadelphia Hospital on September 2d, 1870. The history obtained showed that he had enjoyed good health until four months before admission, when jaundice gradually appeared. The yellowness grew steadily more and more marked, and he lost flesh and strength rapidly. He had never suffered from an attack of hepatic colic, and the present sickness had come on without pain. On admission the jaundice was intense, affecting the conjunctiva and the whole cutaneous surface. His mind was clear but dull, and he

usually lay in an apathetic, lethargic state. His weakness was so great that he rarely left his bed, and his emaciation was extreme. There was entire anorexia; the bowels were constipated, and the stools grayish-white in color, tough, and very offensive. No free fat was observed in the stools. The urine was rather scanty and contained no albumin, but was dark brown in color. Tests showed the presence of abundant bile pigment, but on applying to it Hoppe's test for bile acids, none were detected. The abdomen was meteoric. The area of hepatic dulness was normal, and no tumor or irregularity of the surface of the liver could be felt. The gall bladder could not be detected. There was no tenderness over the liver. The skin was usually dry; perspiration, when it occurred, was deep yellow. There was at no time any fever.

At the autopsy all the viscera were deeply stained yellow. The kidneys contained numerous large cysts. The liver, of normal shape, was somewhat enlarged in size, but much more dense and heavy than normal, weighing five pounds. The liver tissue was deeply stained with bile, and coarse-grained, as though in the first stage of cirrhosis. The radicles of the gall ducts throughout the organ were much dilated and filled with grumous bile. The larger branches of the hepatic ducts, as the transverse fissure was approached, contained numerous polygonal, brownish-black gall stones. The hepatic duct itself was enormously dilated (at least one inch in diameter), and was filled with very numerous calculi. These calculi for the most part measured one-fourth to one-third of an inch in diameter. There was one, however, fully two-thirds to three-fourths of an inch in its measurements, and with rounded edges, which was firmly impacted in the hepatic duct just above its juncture with the cystic duct. The common duct itself was somewhat dilated, either from the previous passage of smaller calculi, or, more probably, from the dilating action of the impacted stone. The gall bladder was considerably distended with light-colored bile, and contained numerous minute blackish calculi. There was no thickening, inflammation, or ulceration at any point of the biliary passages.

Here had been prolonged and entire occlusion of the hepatic duct, and yet no hepatic fever had resulted, because at no point in the biliary passages was there evidence of abrasion or inflammatory action; there had simply been resorption into the body of the normal bile. The patient's health had suffered from this protracted occlusion very much more markedly than was observed, for instance, in the well-known case reported by Bristowe, of London, where for a long time a patient was under observation with a biliary fistula. A tube had been introduced into the duct so that all the bile escaped externally, none entering the intestine, as shown by the condition of the feces and of the local lesion, and yet there was very fair main-



tenance of the patient's health. There are a few similar cases on record. I will add the record of another interesting case of obstruction of the bile ducts without fever, which was under my care lately.

CASE II.—H. N. B., aged seventy-five, began to feel sick December 20th, 1887, at which time he weighed one hundred and sixty-five pounds. Twelve years previously, about 1876, he had a spell of pain followed by jaundice. He also had several spells about 1883. Subsequently he was pretty well up to September, 1887, after which he had occasional slight attacks of pain in the region of the liver, followed by a little jaundice, and then had a severe attack on December 20th, 1887, and a second one in February, 1888. After this they occurred almost every week, and the jaundice was constant, though fluctuating in degree and passing away somewhat in the intervals. He had no fever at any period in the course of his case, but had, however, occasional sweats, chiefly of the legs.

He came under my care in April, 1888, when he was losing flesh rapidly and was constantly deeply jaundiced. The urine contained bile, but the fæces were not putty-colored. Examination showed slight enlargement of the liver, but no mass could be found, nor was the gall bladder distended. There was no tenderness on pressure over the liver, but only a deep-seated sense of discomfort. He continued to have occasional spells of pain, with deepening jaundice but without fever, until summer, when he went to his country seat and I saw him but occasionally. He now had a series of very alarming spells with slight chills, followed by pain, prostration, and sweating, but without fever; there was constant deep jaundice. On July 8th he had an alarming spell, during which he fainted, and immediately afterwards discharged a large amount of golden-yellow, thick bile by the bowel, estimated at two pints. He continued to discharge this in smaller amounts for three days, and then seemed to improve. On July 28th he had his worst spell, fainting and lying unconscious for an hour and a half. After this attack the pain, which had always been over the liver, about the short ribs on the right side, suddenly changed and was in the middle, below the umbilicus; and he never had any pain in the hepatic region afterwards. From this date until October 31st every stool was examined, but no calculus was found. The stools were very varied, sometimes in ribbon shape, sometimes round; but, whether flat or round, they were always grooved, as if forced past some round, hard object. Their color was at times brown, green, and white, and at other times there was a light green liquid, but no pus was seen. From July to December he had numerous spells of pain, always low down in the middle of the belly; and in such attacks he always had impaction of the cæcum, requiring laxatives, which would bring away ribbon-shaped fæces. After August his only

treatment was rest, massage, careful diet, and olive oil. He was so reduced that he weighed only one hundred and ten pounds, and so very anæmic that he fainted on several occasions. His last spell of pain was on November 25th, after which he gradually and steadily improved. He is now in perfect health, in his seventy-eighth year, and weighs as much and can walk as briskly as at any time for years past.

I believe that this case was one of large calculus with accumulation of bile behind it; and that the calculus escaped into the intestines, and remains fixed there, probably in a pouch of the colon, up to the present time.

I have spoken thus of the mere occlusion of the bile ducts, and of the fact that they often give rise only to these distention results without hepatic fever. It is probably true, as already stated, that extreme distention may favor the admission of pyrogenic substances by impairing the ptomaine-destroying function. But it must also be noted that after occlusion has lasted some time, the irritation of the wall extends to the connective tissue surrounding the duct, and we have set on foot a peri-angiocholitis which may spread more or less extensively through the organ. Not only this, but when morbid discharges occur and mix with the retained bile we may find either a large abscess or a number of small miliary abscesses scattered through the liver, even to the capsule. Thus it is that in some cases of occlusion we have no fever, and in others the typical form described is present.

If we now try to explain the apparent periodicity which occurs in some cases of hepatic fever, it seems attended with considerable difficulty. If there be a fixed lesion, as, for instance, a suppurative inflammation of the gall bladder, there we have a distinct pus-forming centre, and we may have a true pyæmia. Naturally, in such cases, we find an explanation for the febrile process with regularly recurring, often quotidian paroxysms, just as we find with a pus centre of similar character elsewhere in the body. But in those cases—and they constitute the majority of the cases—where the paroxysms do not recur every day or every third day, or with any regularity, and yet recur frequently, it seems as if we must assume the existence of a lesion not continually sufficient to cause fever, but which is extremely liable to be increased by external causes.

Take, for instance, a catarrhal angiocholitis, an inflammation of the bile ducts of a catarrhal character, with a certain amount of thickening of the walls of the ducts, and a relaxed and enfeebled condition of the system; here is a state singularly prone to exacerbation and increase from external causes—such as a chilling of the surface or an indiscretion in diet; increased swelling of the mucous membrane and total occlusion of the ducts are the results,



and there is a mixture with the bile of the morbid discharges from the inflamed mucous membrane, and at the same time an intense local irritation acting upon a system which has become highly sensitive.

I shall read to you the notes of a case where a long-continued series of these paroxysms were evidently explicable on this supposition.

CASE III.—H. B. D. came under my care on March 19th, 1888. For many years he had been greatly exposed on the plains in the West, subsisting on coarse food. His best weight was one hundred and fifty, but for twenty years it was not above one hundred and thirty-five. In 1880 he had congestion of the lungs in Texas, and has been susceptible to colds since then, catching cold frequently every winter. He had diarrhoea through the summer of 1885, and again in the summer of 1887. He was in the West, exposed to intense heat, and had returned to Nantucket, where in August he had his first chill, and has had chills since then at irregular intervals, from daily up to seventeen days apart. The chills were severe at times, lasting distinctly for an hour. They were followed by fever ( $102\frac{1}{2}^{\circ}$  to  $104^{\circ}$ ), ascending for from six to twelve hours and then quickly dropping, so that the temperature within two or three days was almost normal. No treatment prevented their return. At about the same time (September, 1887) pain began to be felt in the right side; but on one occasion only were the chill and attendant pain so violent that hypodermic injection of morphine was required. Jaundice first appeared in October, 1887, and has continued more or less since, at times very deep, at other times almost absent. It always comes promptly after a chill, when the urine also becomes very high-colored. The stools are light but never clay-colored, and always have contained bile.

When I first saw him I made the following note: The chills now recur about twice a week, but irregularly. The patient has progressively lost flesh and strength. Ascites appeared February 15th, 1888, and has increased, so that now it is very considerable. The urine contains a small amount of albumin, specific gravity 1.021 to 1.023, with abundant indican at all times. It was extremely difficult to obtain the reaction of biliary coloring matter, and repeated tests gave negative results. But on getting the urine perfectly fresh and preventing decomposition of the bilirubin by the addition of a little ether, it was obtained. This observation seems important as bearing on the rapidity with which the organic bodies in the bile may break up, whether or not from bacterial action, and thus bearing also upon the development of irritating ptomaines in obstructed bile ducts.

The diagnosis adopted was that of severe catarrhal angiocholitis, and the result verified it. Paracentesis of the abdomen was per-

formed three times, and several gallons of clear yellow serum were withdrawn each time. The patient was treated with absolute rest in bed, rigidly strict diet, and alternating courses of nitrate of silver and potassium iodide. He took at first twenty-five grains of silver, then after an interval of a month fifteen grains, after another interval fifteen grains more, and subsequently took it at short periods when spells recurred. Careful study showed that there had been no periodicity in the chills, and that they had always been produced by exertion and exposure. He had finally become so sensitive that the most trivial exposure was sure to be followed by a severe chill. The ensuing fever, running up to  $103^{\circ}$  to  $104^{\circ}$ , was followed by profuse sweat, intense jaundice, and furious itching. His restless spirit led him to rise as soon as he was able to do so, and immediately after doing so there would come another spell. In this way a certain semblance of regular recurrence was produced. After he was confined to bed the spells subsided and soon ceased, and he had none as long as I kept him in bed, which was nearly four months; at the end of which period he was almost free from jaundice, had no ascites, and had gained flesh and strength. He immediately began to overtax his strength and to expose himself. He would then take cold and have a recurrence of jaundice; but as the tone of his system improved, and with the improvement in the local conditions, there was continually less and less fever with the spells, though it was not unusual for it to go up to  $101\frac{1}{2}^{\circ}$  and  $102\frac{1}{2}^{\circ}$ . The urine continued to contain a trace of albumin, and occasionally a hyaline cast would be found. The blood showed, at different times, from sixty increasing to eighty-five per cent of hæmoglobin, and from 3,400,000 up to almost normal of red-blood globules. His improvement was thus progressive but fluctuating, and the case required constant, close watching. For instance, after being entirely free from fever and jaundice all summer at Nantucket, he overtaxed and exposed himself in September, 1889, in New York, and brought on a chill with high fever and return of jaundice, which confined him to bed for more than two weeks. Since then he has improved steadily, and is now in very good health. He is travelling in the West, and is using a drachm of glycerin twice daily with potassium iodide.

In the following interesting case the symptoms and the course of the disease were very similar to those just narrated.

CASE IV.—Henry E. K., aged forty-nine, seen in consultation with Dr. E. E. Montgomery. He had catarrhal fever with jaundice in August, 1889, and since then has not been well. He is a finely built, large man, who had not had a day's illness in thirty years. He is abstemious in habits, but has worked very hard and had much responsibility. During the past two or three years he has had several mild attacks of hepatic colic, but no jaundice. He

was slightly jaundiced in September, and then had chills and fever of tertian type for several weeks, which were not controlled by quinine. The chills varied in intensity, being sometimes slight, but occasionally severe, with shaking. They occurred at different periods of the day, but usually in the morning, and were followed by fever of from  $102^{\circ}$  to  $104^{\circ}$  lasting into the night, and ending with a sweat during the night, so that the temperature was down on the following morning. The jaundice that followed was variable both in depth and duration. During twenty-four hours, when he had one of these spells, he passed about thirty-five ounces of urine, containing 1.9 per cent of urea, or about three hundred grains in all. The appetite was poor, the stools clay-colored and either loose or costive, but he had no severe pains or soreness in the region of the liver. On November 1st he had a severe chill, and three days later a mild chill, and then violent pain and deep, persistent jaundice. He continued to have chills and fever with increasing frequency throughout November and December; they would recur upon any exertion or exposure. Even after he was kept continuously in bed and upon an exclusive milk diet, he had several, but with decreasing severity and at increasingly long intervals. There were fulness and a slight sense of resistance in the region of the gall bladder, with slight relative impairment of resonance over the duodenal region. No calculus was ever found in the faeces. He was confined rigidly to bed for a number of weeks. Repeated blisters were applied over the region of the gall bladder. He took alternating courses of silver nitrate with opium and belladonna, and of potassium iodide. The jaundice has now completely passed away. There has been no spell for a considerable period; he is rapidly regaining flesh and strength.

Without dwelling upon a question of diagnostic interest, I would call special attention to the importance of estimating the daily amount of urea excreted during such paroxysms, in order to establish or refute Regnard's statement that, in distinction with what occurs in malarial paroxysms the amount of urea excreted is reduced in hepatic fever.

In considering the mechanism in such cases as these, we are struck by the presence of intense local irritation and of probable septic action. There is occlusion of larger or smaller branches of the bile ducts—not necessarily of the main duct, since bile may be constantly present in the faeces—so that the network of ducts in only a small area of the liver may be involved, and the mucous membrane be in a state of chronic catarrhal thickening. After each of the first few paroxysms the patient promptly returns to his usual habits, and, sooner or later, induces a renewal of inflammation with obstruction and all the symptoms of an attack. The system soon passes into a morbidly sensitive and pyrogenic state;

the heat-controlling mechanism becomes so easily disturbed that mere reflex irritation from a spot of exaggerated catarrhal inflammation may suffice to bring on a spell; but in addition to this the lesion of the mucous lining of the affected bile ducts becomes more and more serious, and complete obstruction more and more readily produced. The morbid discharges from the inflamed mucous surface, which have been escaping with the bile, are then retained and induce septic changes in the contents of the ducts. There is thus the double element of acute local irritation acting on a system in a state of exaggerated sensibility, and a source of septic infection acting on a system where the ptomain-deströying function of the liver is more or less impaired from the distention of the ducts.

It will be seen at once that in such cases the diagnosis from hepatic abscess must be considered with the greatest care. Certainly in Case III. (H. B. D.) it seemed at first as though there must be grave organic disease. A careful consultation was held in regard to laparotomy after the first paracentesis; but after repeated examination I was unable to satisfy myself that the condition justified even exploratory puncture. After prolonged confinement to bed, it became evident that the hepatic fever was not connected with a fixed suppurating centre from which septic absorption was taking place, but was connected with a varying degree of angiocholitis, and that the gravity of the symptoms was even more dependent upon the constitutional condition of the patient than upon the seriousness of the local lesion. The complete recovery of the patient has confirmed this view, and the rapid progress of H. E. K. toward recovery justifies a similar diagnosis in his case.

While it is true that, in occlusion of the ducts, there may be only dilatation of the smaller ducts above that point, with alteration and atrophy of the cylindrical epithelium and, of course, with some interference with the functional activity of the liver, it must not be forgotten that there is constant danger of such dilated ducts becoming attacked with inflammation which will rapidly result in more serious lesions. The retained bile becomes grumous and decomposed, containing shreds of detached epithelium and flakes of muco-pus; suppuration occurs in the connective tissue adjacent to the ducts, and a section of the liver may show disseminated miliary abscesses, sometimes closely clustered around the main duct, and sometimes situated at the ends of minute ducts so as to show as yellowish points immediately under the peritoneum. In other cases the process may go on to the production of a large single hepatic abscess. In cases where such suppuration is escaped, but where the angiocholitis is severe and deeply seated, the inflammation of the connective tissue around the ducts may go on to the gradual production of one type of cirrhosis of the liver; and you are all

doubtless familiar with this development as a result of recurring catarrhal inflammation of the bile ducts.

While, however, the cases above reported show that even when there have been very grave lesions, doubtless short of actual supuration, the insistence upon protracted rest and rigid hygiene with suitable treatment may cause a gradual subsidence of the angiocholitis, with return of the functional activity of the liver, I suspect that in the great majority of cases of hepatic fever, such as I am describing, there is pus present at some point about the liver. The supuration may, as in the following case, be seated in the gall bladder, and also take the form of a miliary abscess close to the peritoneum, of course defying operative interference.

CASE V.—Mr. F., aged sixty-three, consulted me on September 15th, 1889. He had typhoid fever in 1882, and since then had often had pain in the back of the head. In the spring of 1887 he had several spells of hepatic colic—in all probability with gall stone—followed by deep jaundice and intense itching. In the intervals between these spells he apparently regained his usual health, but for the past year had clearly been failing. He had lost much flesh, had suffered from insomnia, and recently albumin had been detected in the urine. He had also had several severe spells of hepatic pain, each time followed by fever and by local tenderness and deep jaundice. Thus, in March, 1889, he had a severe spell of pain in the region of the liver, lasting nearly all day, followed by jaundice for six weeks with severe itching, and another in April; but all was cleared up in June or July. He had another spell in August, and had been deeply jaundiced since then, and his general condition had failed more rapidly. I found his urine with a specific gravity of 1.019 to 1.013, neutral or slightly acid, with a moderately thick ring of albumin, and with quite numerous epithelial and granular casts; no sugar. This condition of urine persisted until his death, on November 12th. There was marked tenderness over the bile ducts. In spite of continued rest in bed, and with very careful diet, repeated small blisters, and, internally, silver nitrate with belladonna, and olive oil, he continued to have, at short intervals, recurring spells of pain, followed by deeper jaundice, worse itching, and more tenderness. In each of these spells there was distinct fever, but he had no severe chill until about November 1st. From then until death he had, almost daily, a violent chill with chattering teeth, followed by rise of temperature to 105°, and ending in a profuse sweat. The jaundice now subsided decidedly, although he still remained somewhat yellow. The stools had never been putty-colored, but only yellowish, and now were brownish. The urine cleared up, but continued to show the features as before stated.



Post-mortem held thirty hours after death. Body somewhat emaciated ; jaundice marked ; rigor mortis present.

*Abdomen* alone examined. On section there was found a good layer of the fat in the subcutaneous tissue of abdominal walls. All of the tissues bile-stained. Omentum adherent very lightly by fine bands to the parietes at scattered points. The liver protruded below the costal margin about three-fourths of an inch ; was adherent over the posterior, upper, and right lateral surfaces to surrounding parietes of abdomen, by universal adhesion rather than by bands. This adhesion was most marked posteriorly, where considerable difficulty was experienced in liberating the organ. There was no collection of pus in the peritoneal or retroperitoneal spaces. *Spleen* : Large, soft, and of a pinkish-buff color. Pulp diffuent and grayish, but without purulent character ; typical high-temperature spleen. *Kidneys* : Large and coarsely lobulated. Capsule strips off with moderate ease. On surface of right kidney was a cyst of about the size of a marrowfat pea, containing dark fluid. Surface of organs finely granular. On section : Vessels distinct and striation very plain ; slight decrease of cortical area. Pelvis and ureters normal.

*Stomach, duodenum, pancreas, and liver* were removed together. The *pancreas* was partly bisected and a probe placed in the duct, which was found to enter the duodenum at the papilla in the normal position. The gland tissue was, to the naked eye, normal. The *duodenum* and *stomach* were opened along their anterior face, and were found to be normal. The pyloric ring was of proper calibre.

The *liver* was large, rigid, and firm, of a slate color, with rounded edges, which gave a feeling of tenseness when pinched. Round ligament normal. The gall bladder was only found after prolonged search and careful dissection through the surrounding thickened, dense connective tissue. On pressure the gall bladder was found to contain fluid, but could not be emptied by pressure. No stone could be felt through the walls. On opening it was found to contain about half a drachm of thick, creamy pus. On careful probing a fine orifice was found, which traversed a band of adhesion uniting the tip of the bladder to the duodenum, and of a length of about one-half inch, the probe entering the duodenum about one inch below the pyloric ring. The hepatic artery was normal in size and position, as was also the portal vein. The common bile duct was at first mistaken for the portal vein by reason of its size. On slitting up the common bile duct its wall was found to be thickened, its cavity dilated to finger size or larger, and its mucous membrane thickened, rugous, and in places mammillated. The cystic duct appeared as a cul-de-sac branching from the common duct and resembling it in calibre, character of mucous membrane, and thick-

ness of wall. No communication with the gall bladder existed. There was no ulceration of the mucous membrane, which was studded with the enlarged orifices of glands. On following up the dilated common into the dilated hepatic duct the same increase of calibre was found. This distention was traced up throughout the branches in the liver, even in some places to the periphery of the organ, where they resembled the ends of glove fingers. On slitting up one of the ducts in the liver, it was found to open into a marble-sized pus cavity close to the surface of the liver, the pus contained being thick and pinkish. The liver section was granular, coarse, friable, and nutmeg in appearance; evidently fatty and cirrhotic.

Again, in the following case, No. VI., very similar, though even more aggravated, lesions were found.

CASE VI.—I saw Dr. C. G. E., in consultation, in Binghamton, N. Y., on July 5th, 1880. He was thirty years of age, and had enjoyed good health. His father and his younger brother had suffered from hepatic colic. He himself had been liable to such attacks for seven or eight years, but, after a trip to Europe five years ago, they seemed to have been arrested; but again in the past three years he had six or seven attacks. These apparently were attacks of catarrhal inflammation, with spasm of the bile duct, but followed by very little organic change. On no occasion did they compel him to abandon his work. During the spring of 1880 he had been unusually busy, and had lost a good deal of rest. He was taken ill about the 14th of June with a chill, pain in the back, subsequent fever, and an intense pain in the region of the epigastrium and gall bladder. Repeated hypodermic injections of morphine were needed to control the pain. There were several quite severe chills in the first thirty-six hours, with copious vomiting of bilious matter, while the temperature ran up after each chill to  $105\frac{1}{2}^{\circ}$ . He took calomel freely, in addition to the morphine; and later, when the tendency to return of chills showed itself, quinine was given in full doses. He continued to complain constantly of great pain about the gall bladder. Vomiting ceased, but there was a tendency to hiccough. The temperature subsequently ranged from  $102^{\circ}$  to  $103^{\circ}$ . The tongue was heavily coated and dryish. There was a slight tinge of sallowness, but nothing amounting to marked jaundice. Examination showed an area of dulness in the region of the gall bladder, extending three inches below the ribs. It was evidently not the distended gall bladder, but appeared to be a partial enlargement of the right lobe of the liver, with matting of the adjacent tissues. It appeared indurated, and, on pressure, was very tender but without fluctuation. The fever was markedly hectic in type, with tendency to profuse sweats at night. The urine was discolored and contained bile. The stools were brownish, and even at times blackish, though probably from bis-



muth. The urine contained no albumin. The general liver dullness did not extend above the normal limit, nor did it extend uniformly below the margin of the ribs; but there was a very distinct semicircular area of greatly impaired resonance and increased resistance, with exquisite tenderness on pressure, which extended from the right nipple line to the median line, and from the lower margin of the ribs downward about two inches.

He did well from July 5th to July 11th, when there was a violent chill, followed by very high fever and cold sweat, leaving him much exhausted. There was still no decided jaundice. After this he continued to have irregular chills with high fever.

I visited him again on July 24th. He was then extremely weak, with a glazed, dry tongue and thready, frequent pulse. The abdomen was distended. The area of dullness previously described was even more marked. There were decided hectic symptoms, though no distinct chill had occurred since July 12th. As the signs of internal suppuration were so clear, I proposed an exploratory puncture, which was agreed to. I introduced a medium-sized trocar about half an inch below the margin of the ribs, in the region of the gall bladder, and in a direction upward and backward to a depth of two and a half inches. However, nothing but a few drops of blood entered the vacuum. He died within a few days afterward, and the post-mortem examination showed that there was no gall stone and no obstruction of the main bile duct. The gall bladder was the seat of chronic inflammation: its walls were thickened and its cavity greatly contracted. It contained muco-purulent matter. There was marked circumscribed plastic peritonitis around it. The central portion of the liver was much enlarged, and extending upward into this area for a distance of several inches, and occupying a space of four inches in width, there were clustered around the lines of the bile ducts numerous small abscesses. These varied in size from a pea to a hazelnut. In some instances the abscess cavity connected directly with the bile duct, and it seemed as though it might be a collection of pus in a dilated duct. More probably, however, the limiting wall was of morbid formation. The bile ducts throughout the liver were distended, and there were a few small abscesses at distant points of the organ, near the capsule.

Without entering into the highly interesting questions of diagnosis connected with these cases, I may point out that in the latter case the manifest enlargement of the liver in the region of the gall bladder called for exploratory puncture, although the symptoms had led me to expect disseminated miliary abscess, as indeed was found to exist. Did time permit I would be glad to describe to you cases of uncomplicated purulent inflammation of the gall bladder with similar fever, and also the more familiar type of case where a large calculus escapes from the gall bladder by progressive ulceration

opening into the intestines. I have seen a number of cases of this kind attended with typical hepatic fever of great severity, lasting for many weeks, and yet terminating in recovery. In one such case, which I have published elsewhere, the patient died years after of pneumonia, and the autopsy showed complete obliteration of the gall bladder and cystic duct, so that the middle finger could be passed directly from the duodenum into the dilated ducts of the liver. The gall stone was found in one of the pouches of the colon. In the following case, on the other hand, there is every reason to believe that the recurring attacks of angiocholitis resulted in the formation of a single large hepatic abscess. It is notable that, in connection with the violent outbreaks of fever, there was neither intense pain nor deep jaundice. It can scarcely be doubted, however, that the origin of the pus evacuated by stool was from the liver.

CASE VII.—A. B., aged forty-six, married, had been exposed to very bad air in the court room, and had also drunk water freely from a dirty receptacle. Last spring and through the summer had intestinal indigestion, with tendency to looseness of the bowels. This fall he assumed additional labor as professor in a law school. After great exhaustion and loss of sleep, was taken with fever; heavily coated tongue, foul breath; temperature  $103^{\circ}$  to  $104^{\circ}$ ; urine heavily loaded and contained some bile. No characteristic spots, no nose-bleeding or bronchial symptoms. The case ran a course for three weeks like an irregular typhoid. He was apparently improving and his temperature was down, when he had a chill while in bed and while still on liquid diet, so that there was no apparent cause. The temperature went up to  $104\frac{1}{2}^{\circ}$ . The following day it fell almost to normal, but rose again in the afternoon, and so on three successive days. At this time there was discomfort in the hepatic region. The urine contained more bile, and there was slight jaundice. He again improved, and the fever almost disappeared, but in two weeks there was a similar recurrence of chills with high temperature. He had taken abundant quinine from the beginning of the case until this time. There was a repetition of the same hepatic symptoms. After this there was again improvement, even more marked than formerly. At this time there was a mild attack of phlebitis of the right leg. After this he again improved, and for more than three weeks was free from fever; he began to sit up for several hours daily, and cautiously resumed solid food, when, on December 20th, after taking a greater variety of solid food than he had done before, he was again attacked with chills, the temperature going up to  $104^{\circ}$  and over, and recurring on three successive days with similar hepatic symptoms. At no time had the tongue become clean or the breath sweet, though it was much improved before this last attack.

He had taken, with apparent advantage, cold-water enemata of about one pint, at a temperature of  $65^{\circ}$ ; but, despite extreme care in

every particular and the most judicious treatment, the attacks of fever recurred. I saw him in consultation with Drs. W. W. Johnston and Busey, of Washington, on December 23d, 1889. For a few days subsequently the hepatic fever was intense, the chills occurred more than daily, the subsequent fever was very high ( $104^{\circ}$  to  $105^{\circ}$ ), and the sweats profuse. On Friday, the 27th, he was extremely feeble and ill, and the chilliness and sweating were almost constant. He had a strong call to stool and passed six ounces of offensive, decomposed pus. On Saturday night he passed eight ounces of the same material. Following this discharge he made a gradual but complete recovery. The diagnosis of hepatic abscess in this case was supported by the exclusion, after repeated and searching examination, of any other source for the pus.

We have thus seen illustrations of various lesions in connection with which hepatic fever may present itself. We have also seen that similar lesions may exist without the production of this particular type of pyrexia. An attempt has been made to indicate some points of interest and importance in connection with the mechanism of its production. It has been assumed that this hepatic fever is not of very frequent occurrence; but, although I may have happened to meet with a larger number of cases than should rightly fall to my lot, I am sure that it is not nearly so rare as has been represented. It seems important to place on record all carefully observed cases, on account of the extreme difficulty in the differential diagnosis of the lesions, as well as in connection with the explanation of this type of fever and with the special conditions of the liver as regards its antiseptic secretion and its ptomaine-destroying function.

I will not attempt to speak fully to you of Weil's disease. This affection has only in the last few years been described as a separate entity; I do not think it comes properly at all under the class of cases I am describing. Everything connected with it seems to me to prove that it is a special infectious disease, which requires much more close study in the hope of isolating the peculiar poison which produces it. The conclusion of all who have seen many cases is that it comes under the class of infectious fevers. It begins abruptly; it is attended with slight enlargement of the liver, and great enlargement of the spleen, and marked alteration of the blood. Between the fifth and seventh days the temperature falls, sometimes reaching the normal. About the tenth or twelfth day there may be an accession of fever, though not a true relapse. There are characteristic pains in the limbs, especially in the calves, rendering motion intolerable. Jaundice is the most characteristic symptom. There is a difference of opinion as to whether the jaundice is from obstruction or alteration of the blood; my own judgment favors the latter view. There may be nephritic symptoms: albumin, tube casts, and blood in the urine are common and very serious symp-

toms. Bronchitis, epistaxis, purpura have all been observed as accidental complications. The disease has been observed in vigorous men of middle age, rarely in women and children.

One case, clearly to me of this nature, I find I have recorded in 1883 under the title of "acute infectious jaundice"—a name which I would at present suggest for this disease until its nature is more accurately determined.

This occurred in the case of a travelling salesman, thirty-eight years of age, of muscular frame and excellent general health, whom I saw in consultation in the northeastern part of Philadelphia, a healthy district. He had suffered from some malarial symptoms in previous years, but not recently, and during his last journey had not been in a malarial district. He had not been specially fatigued, and no reason could be assigned for the onset of the disease, which made its appearance immediately on his return to his home.

I found the patient, in the evening of the third day, with a temperature of  $105^{\circ}$ , with a wild, excited expression, injected eyes, wildly delirious, with strong tendency to walk up and down the room, requiring the efforts of several men to restrain him. He complained of severe pain in the head and through the frame generally. He was already intensely jaundiced, the discoloration being peculiarly deep. This continued with increasing depth until his death, on the sixth day. He had already vomited several times; the stomach was non-retentive during the second day, but subsequently, with the deepening mental dulness, the stomach became quiet. The temperature sank to  $102^{\circ}$  on the third day, and continued to fall until toward death, when there was a rise again. The tongue was heavily coated, and soon became brown and dry. There were no pulmonary symptoms. The bowels were quiet, but responded to enemata. The spleen was distinctly swollen; the liver appeared normal in size. The pulse was rapid, 130, and this rapidity continued despite the deepening stupor and symptoms of blood-poisoning. The urine was not obtained until the end of the second day. It was then found albuminous, with epithelial and granular tube casts. The amount secreted was small and intensely bile-stained. Death occurred in deep stupor, and was preceded by convulsive twitchings. The post-mortem examination showed no lesion of the brain; hypostatic congestion of the lungs; the spleen enlarged to double its size, very dark, and somewhat softened; the liver about normal in size, unusually dark, apparently very little, if at all, softened. Microscopic examination showed marked granular disintegration of many circumscribed areas of cells. The bile ducts were pervious, and no obstruction was found to explain the jaundice. Of course the mucous membrane may have been swollen during life, and the swelling have disappeared after death. There were no lesions of the intestinal glands; the kidneys were engorged with blood, and presented marked changes of infectious



nephritis. The case was regarded as one of infectious disease of an unknown type. Unfortunately, there were at that time no facilities for examining the blood and tissues carefully for microbes.

Clearly this acute infectious jaundice, which has close relations with *icterus gravis* of the older writers and of the present German school, has no relation whatever with the type of hepatic fever which I have described. It is connected in all probability with the entrance into the system of some specific infectious organism. I mention it to limit our field of discussion of hepatic fever more closely to the points I have proposed.

In conclusion: Although, as before stated, the term "hepatic fever" is more or less a misnomer, since there are various affections of the liver attended with other types of fever, yet there is a degree of usage which perhaps justifies retaining this name in connection with the particular paroxysmal fever I have described. It occurs at irregular intervals and is connected with angiocholitis, with more or less extensive occlusion of the ducts. At times there is no proof of the existence of pus or of septic action, although in the great majority of cases the pyrexia is associated with a purulent lesion at some point of the biliary canals. I will detain you but a moment to ask your attention to the analogy between these febrile attacks connected with the liver and "urethral fever," as it is often styled by surgeons. In doing so, I will take the opportunity of referring to the admirable account of these two types of fever by Charcot, to whose instructive paper there has been comparatively little of value added. We are all familiar with the sudden explosions of high fever,  $103^{\circ}$  to  $105^{\circ}$  F., usually preceded by a chill, which may occur in persons who have been subject to prolonged vesical or urethral irritation, and where the thickening of the mucous membrane and other coats of the urinary tract has occasioned more or less occlusion associated with the production of morbid discharges. For, although urethral fever may occur without a previous morbid state of the urinary passages, it is far more apt to arise in connection with such lesions. The irritation caused by the passage of a catheter or the sudden development of complete occlusion at some point of the partially obstructed passages, may, under such conditions, give rise to violent outbreaks of fever which are evidently strictly analogous with those we have studied under the name of "hepatic fever."

I must here bring these desultory remarks to a close, trusting that the imperfect record I have presented to you will be the means of eliciting, from the immense wealth of pathological material which this city contains, fuller contributions as to the frequency of hepatic fever and as to the various lesions with which it is most often associated. With such extended studies, it is not too much to hope that the special conditions or agents which, in certain cases, determine its occurrence, may be investigated with complete success.



PROCEEDINGS  
OF THE  
NEW YORK PATHOLOGICAL SOCIETY.

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*Stated Meeting, January 22d, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

DR. GEORGE C. FREEBORN showed three large cystic tumors of the ovaries which had been hardened in the fixing fluid described at a meeting in December. He presented them to show that the fluid was useful in preserving large cysts as well as small ones. The walls of the tumors were firm and resilient, looking almost as if they were tanned.

ENORMOUS DILATATION OF THE HEART.

DR. EUGENE HODENPYL presented a heart removed from the body of a man about twenty-one years of age. He was found on the street suffering from the most intense dyspnoea, and was carried as quickly as possible to the hospital. There it was found that the area of cardiac dulness was greatly increased, and it was supposed that the case was one of pericarditis with effusion. The man's condition was such that it was impossible to get a satisfactory history of the events preceding his admission to the hospital. There was extreme cyanosis, and the dyspnoea was most painful. It was determined to tap the pericardium, but before this could be done the man died. At the autopsy the heart was seen to be greatly dilated, measuring seventeen inches in its greatest circumference and nine inches in its longest diameter. When cleared of all clots it weighed about forty ounces. One cusp of the aortic valve was nearly destroyed, but the mitral appeared to be normal. The pericardium was adherent. Dr. Hodenpyl said that the question had arisen in his mind whether it would not have been justifiable to aspirate the heart, even if the true condition had been known. The patient was suffering greatly from dyspnoea, and the operation might have given him a little relief before he died.



DR. H. P. LOOMIS asked whether the heart had ever been aspirated in such cases.

DR. HODENPYL replied that it had been accidentally aspirated several times, the diagnosis having been made of pericarditis with effusion, and the same would have occurred had an operation been attempted in this case.

DR. DOWD asked whether the movements of the heart would not at once warn the operator that the needle had entered the ventricle.

DR. HODENPYL said that in a heart like this he did not think that there would be much motion, and the fact that the needle had passed into the ventricle would become manifest only by the passage through it of blood.

DR. NORTHRUP asked what the condition of the other organs was—whether there was any degenerative change in the kidneys, for example.

DR. HODENPYL answered that there was venous congestion of all the organs, but no actual disease.

DR. ELY said that the heart was, in his opinion, hypertrophied as well as dilated—that is to say, that the actual increase in the muscular tissue was very great, owing to the enormous dilatation, although proportionately to the size of the cavities the walls were not thickened.

THE PRESIDENT said that the heart had been aspirated a number of times. He had seen the left ventricle pierced and quite a quantity of ammonia thrown in, in a moribund person, without any apparent harm being done.

#### ANGIOMA OF THE LARYNX.

DR. H. P. LOOMIS presented a specimen showing angioma involving one side of the neck, face, and tongue, and the larynx. The patient was a woman sixty-two years of age, who first came under observation last March, suffering from chronic rheumatism. At this time there was observed a tumor, as large as an English walnut, projecting from the side of the tongue. Another mass involved the left side of the pharynx, and both tumors were continuous with a third one extending from the inferior maxillary bone to the clavicle. The tumors were of a purple color, soft, and the tumors of the pharynx and tongue could be enormously increased in size by compressing the tumor in the neck. The woman said that these tumors had existed from birth. She came under observation a second time last November. She was then in a critical condition. The tumors of the tongue and pharynx had increased to the size of a lemon; there was an enormous cervical tumor extending from the level of the orbit to the clavicle. Abdominal ascites and œdema of the legs were marked. The abdominal lymphatics, especially in

the inguinal region, were enlarged to the size of the little finger. The face was cyanotic, and the dyspnœa was so intense that the patient could not lie down. The voice was not changed, but the speech was thick. There was hypertrophy of the heart, and a loud mitral regurgitant murmur was heard. The woman died four weeks after admission to the hospital. Six hours before death she passed about sixteen ounces of blood from the bowel.

At the autopsy the lungs were found oedematous and congested, and there was hypertrophy with dilatation of the heart. There was a moderate amount of chronic diffuse nephritis, and the large intestine showed submucous capillary hæmorrhages. In addition to the tumors of the neck, tongue, and pharynx, there were two angiomatous growths of the larynx, one the size of a large pea projecting from the ventricle of the larynx on the left side, and the other the size of a cherry at the lowest part of the aryteno-epiglottidean fold.

#### AUTOPSY ON A CASE OF HYDROPHOBIA.

DR. LOOMIS also presented a microscope slide showing a section of the spinal cord removed from a boy who had died of hydrophobia, and made the following remarks: "On December 19th, Deputy Coroner Donlin requested me to make a post-mortem examination on a lad, fifteen years of age, who had been bitten six weeks ago on the wrist by a dog supposed to be mad. The boy had remained well until within four days of his death, at which time he became delirious and very violent. As his condition grew steadily worse, he was admitted to the insane pavilion of Bellevue Hospital. On the evening of December 18th he was wildly delirious, throwing himself about on his bed and on the floor. In his ravings he appeared to be afraid that somebody was going to injure him. At times he seemed for a moment to be rational. His eyes had a wild look and the conjunctiva was congested. His face was ordinarily pale, but became suddenly flushed at times. Drs. Fitch and Douglas, the physicians in charge, knowing nothing of the previous history, made a diagnosis of acute mania. The patient was vomiting profusely, and a stomach tube was introduced and the stomach siphoned. Fifteen minutes afterward, while sitting in a chair, he suddenly died, showing some of the symptoms of asphyxia. No fluids had been given to the patient, so none of the effects of swallowing had been noted.

"The autopsy was made twelve hours after death, and, with the exception of engorgement of the cerebral vessels and slight pulmonary congestion and cedema, no pathological condition could be found in any organ or tissue of the body. A microscopical examination of a section of the lower portion of the medulla showed congestion of the capillary vessels, but no structural changes. A portion

of the spinal cord was removed, and was reduced by Pasteur's method to an emulsion in a porcelain crucible, and injected into the subdural space of a healthy rabbit. The animal remained perfectly well for twenty-one days, and then developed the characteristic paralysis of hydrophobia, commencing in the posterior extremities and rapidly progressing, until death occurred from paralysis of the muscles of respiration. A second inoculated rabbit died in the same manner after remaining perfectly well for twenty-three days. The classical course of the disease in the rabbits proved conclusively that they died from the virus of hydrophobia."

#### PHOTO-MICROGRAPHS.

DR. J. H. LINSLEY exhibited a number of excellent photo-micrographs made by Dr. W. M. Gray, of Washington. They were taken with dry plates, and the stain used, in some of the specimens at least, was borax-carmin.

THE PRESIDENT remarked that there was a good deal of difference in the carmine and eosine stains as regards their distinctness in photographs. In some of them there was so much blue that they were almost worthless for photographic purposes, while some others gave a stain that came out very clearly.

DR. FREEBORN said that there was considerable work of this kind done in the pathological laboratory of the College of Physicians and Surgeons, and during the last six months a black stain had been used which gave very satisfactory results. It was a dye which came from Russia, and was called "Platner's Kernschwartz," but its exact composition was not known. It stained the nuclei a deep black, while the cell membrane and protoplasm appeared in varying shades of gray.

#### PREPARING SPECIMENS OF HEARTS FOR THE MUSEUM.

DR. JOHN S. ELY showed a number of hearts to illustrate a method that he had found very useful in preparing museum specimens of these organs. The principal point was to hang the heart by the apex. The heart is first washed thoroughly in cold running water for from twelve to twenty-four hours, and, if it has been cut open, the parts are sewed together by discontinuous sutures. The ventricles are then prevented from collapsing by introducing a little horsehair (a very small quantity will suffice), a thread is passed through the apex, and the heart is suspended in strong alcohol. The specimen sets more rapidly and keeps its shape better if strong alcohol be used. The auricles require no attention, for they will keep open of themselves if the heart is suspended with the apex up.

#### LATE HEREDITARY SYPHILIS.

DR. J. LEWIS SMITH presented several specimens removed from the body of a child, with the following history: About three

months ago the speaker had been called to see a boy, ten years of age, in a family that he had never attended before. The first thing that he noticed on beginning his examination was that the abdomen was very greatly distended, and on palpation two distinct tumors could be made out. The first one was in the neighborhood of the spleen, and the other evidently proceeded from the liver and filled the entire upper third of the abdominal cavity. There was also considerable fluid, supposed to be serous and to result from obstruction in the portal system. There was no fever. The mother stated that the child's health had been good until within seven or eight months of the time that Dr. Smith first saw him, when his appetite began to fail, he became emaciated, and the abdomen began to increase in size. The boy was able to walk about for two months after coming under observation, but grew worse gradually, and for three weeks before death was unable to leave his bed. Toward the last there was considerable dyspnea. The distention of the abdomen was extreme, its circumference at the time of the child's death being fully equal to that of the body of a well-developed man. It was believed that the trouble was cancer, but this was found at the autopsy not to be the case, the lesions seeming to be those of syphilis. There had been no microscopical examination made as yet, but this would be done and the results would be reported to the Society at its next meeting.

The kidneys were somewhat enlarged and showed the lesions of waxy degeneration, and the spleen was also waxy. It was a matter of wonder, after seeing the condition of the lungs, how the child had been able to live as long as he did, for it did not seem as though there were any chance of the blood becoming sufficiently aerated to perform its functions. The left lung was completely collapsed, and the right, though perhaps three times the size of the left, contained air only in its upper portion. The liver was also enlarged, and on gross examination was evidently syphilitic. There was no history of syphilis in the family, and the other children were healthy. One child had died, but it could not be clearly ascertained from what. The boy had exhibited no signs of hereditary syphilis in his early life, the only suspicious point that could be elicited on the closest questioning being that he had been rather subject to colds in the head, and this may have been a syphilitic coryza. The teeth and nose presented none of the appearances which have been described as characteristic of hereditary syphilis, and the patient had been perfectly well up to within two years of his death. If, on further examination, the lesions should be shown to be syphilitic, the case must be regarded as one of late hereditary syphilis.

## MUTUAL TRANSPOSITION OF THE AORTA AND PULMONARY ARTERY.

DR. WILLIAM P. NORTHRUP presented a heart exhibiting mutual transposition of the aorta and pulmonary artery, and patent foramen ovale and ductus arteriosus. The specimen was removed from the body of a male child born in the New York Foundling Asylum. It was at first thought to be a well-formed baby, but it was early noticed to be somewhat blue, and to become markedly cyanotic on crying. It nursed poorly, and after three days became "pale-slate colored," with cold extremities. There was a loud systolic murmur, and the heart's action was violent and palpitating, though the pulse was regular, of fair quality, and 160 to 180 in the minute. Respiration was normal. The child was dull, but easily aroused, and would then become very cyanotic. There were some small abrasions about the nose which never healed, but remained as dark-red spots. After a week the child ceased to nurse altogether and developed bronchitis. There was no œdema. The cyanosis was most marked in the upper extremities. (For this history Dr. Northrup was indebted to the house physician, Dr. George S. Lynde.)

*Autopsy.*—The brain was not examined. The skin was of a bluish dirty-white color. The liver was intensely congested; the kidneys were congested, firm, and dark-red in color; the spleen was small and shrivelled; the thymus was large, and the stomach and intestines were normal. There was a mutual transposition of the aorta and pulmonary artery. When *in situ* the origins of these two great vessels were plainly visible, the aorta arising from the conus arteriosus of the right ventricle, the pulmonary artery from the usual point of origin of the aorta in the left ventricle. The correlation of parts is best understood if we consider this supposition: The aorta and pulmonary artery are separated from their usual attachments, the hypertrophied heart rotated on its longitudinal axis from left to right, the aorta attached to the apex of the conus arteriosus, and the pulmonary artery attached to the point of usual origin of the aorta. It is easily understood that the right ventricle was rolled downward, the auricle nearly disappearing beneath the aorta in its new location, while the left ventricle made its appearance and presented as much surface to view as did the right ventricle, and also showed much of the corresponding (left) auricle. Fig. 1 shows the two auricles and ventricles in equal degree. The left coronary artery, which is usually seen near the subject's left cardiac margin, passes down over the middle of the anterior surface of the heart. It is given off from the aorta and passes downward over the septum ventriculorum. The heart was large for the age of the child, and was hypertrophied in all its walls, most notably in those of the left auricle and ventricle. The ductus arteriosus was patent. The aorta, before receiving the abnormally large ductus, suffered marked



constriction. At the point of juncture of the proximal wall of the ductus with the wall of the aorta there was a concentric fold, made up of aortic wall and ductus, which served to direct the blood stream upward into the vessels of the neck. The foramen ovale was open at its anterior margin, the aperture being about as large as the aorta at its point of constriction. The membrane closing most of the original foramen was thick and redundant, forming a

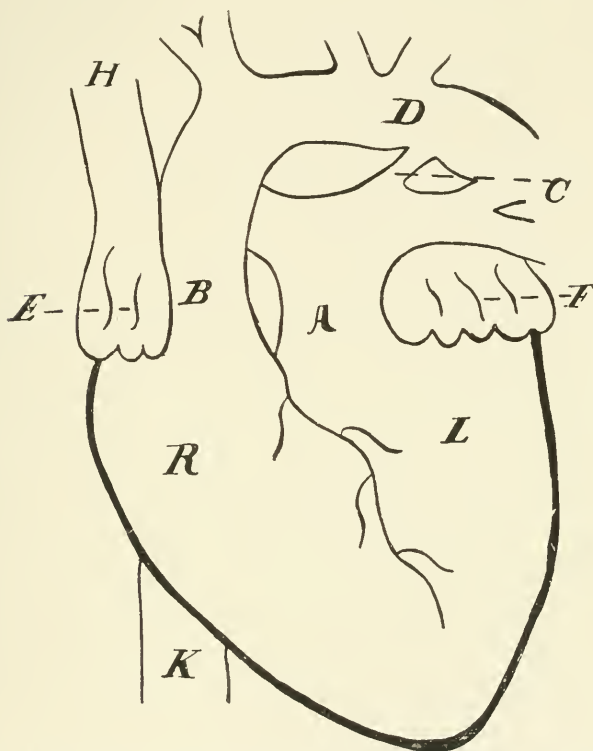


FIG. 1.—MUTUAL TRANSPOSITION OF AORTA AND PULMONARY ARTERY. A, pulmonary artery; B, aorta; C, ductus arteriosus; D, constriction of aorta; E, right auricle, showing little; F, left auricle, showing much more than usual; H, superior vena cava, partially hidden beneath the aorta; K, inferior vena cava; L, left auricle; R, right ventricle.

valve sufficient to close the foramen under pressure from the right auricle, but calculated to open under pressure from the left. In case the blood pressure in the left auricle exceeded that in the right, there would be a current from left to right, but in no case from right to left. Otherwise the auricular septum was complete. The ventricular septum was complete. In short, there were no anato-

mical changes not directly dependent upon the interchange of points of origin of the aorta and pulmonary artery. The venæ cavæ emptied into the right auricle, the pulmonary veins into the left auricle.

*The Course of the Circulation.*—Venous blood entered the right auricle and ventricle through the venæ cavæ, and passed through the transposed aorta to the vessels of the neck and arms. Aërated blood from the lungs passed through the left auricle and ventricle to the pulmonary artery, much of it passing through the ductus arteriosus to the descending aorta on the distal side of the constriction. There was a commingling of blood streams at this point. Again, there was, no doubt, commingling of streams by blood passing from the left to the right auricle through the valve-like redundant membrane of the foramen ovale. In other words, there were two circuits—an arterial and a venous—which commingled at two points, the stricture of the aorta and the foramen ovale. The coronary arteries were given off from their usual locations at the beginning of the aorta, and received their arterial blood from the current which came through the foramen ovale. The lower extremities must have received a good supply of arterial blood direct from the pulmonary veins, left auricle and ventricle, pulmonary artery, and ductus arteriosus. These facts explain the marked cyanosis of the face and hands and the palpitation of the heart.

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*Stated Meeting, February 12th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

REPORT OF THE COMMITTEE ON MICROSCOPY.

DR. JOHN S. ELY, of the Committee, reported that, at the request of Dr. J. Lewis Smith, a microscopical examination had been made of the liver presented at the last meeting of the Society. The lesion was found to be multiple gummata.

ACUTE GENERAL MILIARY TUBERCULOSIS.

DR. J. H. LINSLEY presented specimens and slides from a case of acute general miliary tuberculosis occurring in a child of twenty-two months. The child had been bottle fed on condensed milk up to about three months ago, since which time soups, oatmeal, and cow's milk had been added to the diet. He had never been sick up to three months ago, at which time he was attacked with vomiting of such severity that almost all the food was rejected by the stomach. This vomiting continued pretty constantly for three or four weeks, the abdomen meanwhile increasing gradually in size and the child emaciating perceptibly. Two weeks before admission to the

Hospital of the Post-Graduate School he began to cough at night and had some fever. On admission, January 7th, the child was seen to eat fairly well, but did not seem to be nourished by his food. The child lived in Brazil from the age of eight weeks to that of eight months, and the mother thought that there was some malarial complication. He had a peculiar nodding and tremulous motion of the head, and also what seemed to be a facial paralysis on the left side. The treatment consisted in the administration of cod-liver oil, hypophosphites, and iodide of iron, and the diet was composed of bread and milk and soup; but the child nevertheless failed steadily, and died on January 25th.

*Autopsy.*—The peritoneum was normal, but the mesentery was the seat of numerous small miliary tubercles, and the mesenteric glands were enlarged and indurated. The liver extended below the free border of the ribs a distance of five centimetres. Upon removing the calvaria a large amount of clear fluid escaped from the cranial cavity. The amount could not be estimated with any degree of accuracy, but it was several ounces. The dura mater was firmly adherent to the calvaria, and the vessels of the pia were deeply congested; the pia itself was thickened, and over the portion of the brain corresponding to the occipital lobe there was a considerable exudation of lymph beneath the pia, having an opaque appearance. The substance of the brain was very soft, and all the vessels leading to it were deeply congested. Upon removing the brain and resting it on its inferior surface, the two hemispheres flattened out and separated, exposing the whole ventricular area. The corpus callosum was almost entirely destroyed, and the lateral ventricles were enormously distended with fluid, their cavities reaching to within two centimetres of the exterior surface of the cortex posteriorly. There was an extensive tuberculous deposit on the exterior surface of the anterior portion of the middle lobe of the cerebellum, immediately beneath the roof of the fourth ventricle, and immediately posterior to this was a large suppurating cyst. The pressure upon the veins of Galen must have been considerable, and would account for most, if not all, of the fluid in the ventricles. The heart was normal. There were firm pleural adhesions all over the right side, but none on the left. The left lung was well aërated, and was studded with miliary tubercles throughout its substance, a few being seen on the surface. The right lung was somewhat collapsed, very poorly aërated, and miliary tubercles were to be seen on its surface. On section the cut surfaces were seen to be studded with small miliary tubercles. The bronchial nodes were enlarged, of a firm cheesy consistence, and of a whitish appearance. The left kidney was normal in size and slightly lobulated. In the upper portion of the organ were felt numerous hard nodules, and in the lower portion, for a distance of three cen-



timetres, was a hard, whitish, cheesy mass occupying the entire thickness of the organ. The capsule was not adherent except over the portion corresponding to this cheesy mass. The surface was mottled reddish and white, and there were a few miliary tubercles in the cortex. On section the markings were fairly distinct, and about the centre of the organ there was a small whitish nodule half a centimetre in diameter. In the right kidney the capsule was not adherent. A small discolored area, having the appearance of an infarction, was seen on the lower and anterior surface. Upon section the pelvis was seen to be enormously dilated, the markings were obliterated, and numerous miliary tubercles were seen in the cortex. The left ureter was normal in appearance, but the right was greatly dilated, and there was a hard, whitish mass, about four centimetres from the kidney, which entirely filled the lumen of the tube. The spleen was greatly enlarged and contained two cheesy masses.

Examination for bacilli was negative for the lungs, but the micro-organisms were found in sections of the kidneys, liver, and spleen.

The case was not an unusual one, but was presented mainly for the reason that it was in the line of a number of cases of tuberculosis which had been presented to the Society this winter, in which the lesion in the lung was the least marked. The most extensive deposit was found in the kidney, and it was here also that bacilli were found in greatest abundance.

DR. NORTHRUP thought that cheesy masses, as distinguished from miliary tubercles, were very rare in the kidneys, and said that the demonstration of bacilli was especially difficult in them.

DR. LINSLEY, in answer to questions, said that he did not know the original point of entrance of the bacilli. The bronchial nodes were not broken down. The renal lesion was the most marked of any.

DR. FISHER said that in an older subject we would expect to find some interference with co-ordination in a lesion of the middle lobe of the cerebellum.

#### ANEURISM OF THE ARCH OF THE AORTA.

DR. R. G. FREEMAN presented a specimen, for which he was indebted to Dr. J. S. Thacher, of aneurism of the arch of the aorta. The patient was admitted to St. Luke's Hospital complaining of moderate pain in various parts of the chest, and inability to swallow solid food, although there was no pain on swallowing. He could take fluid nourishment. These symptoms had been present for two months. On admission the pulse was 100 and regular. The radial arterial wall was a little thickened. Over the whole chest a few moist râles were heard, and over the left chest was feeble breathing. The urine was normal. There was flatness on percussion over the

upper third of the sternum, but no pulsation or murmur. A systolic murmur was heard over the apex of the heart. There was paralysis of the left vocal cord. At the autopsy an aneurism was found involving the ascending and transverse portion of the arch of the aorta, four and a half inches in diameter. It contained no laminated fibrin, but a moderately firm and slightly adherent white clot. The œsophagus was ulcerated from the level of the bifurcation of the trachea to a point two inches above. Posteriorly the ulcer had perforated into the connective tissue, producing suppuration with a gangrenous odor. In front of the œsophagus a cavity had been formed in the connective tissue, an inch and a half in diameter, extending down to the diaphragm. The heart was normal. The specimen showed a large fusiform dilatation of the aorta, beginning just above the valve, increasing gradually in size, and ending in a sacculatation of the summit of the aorta. All the large vessels of the neck were given off from the aneurism. The points of special interest were the absence of pulsation and murmur over the aneurism, although it was of considerable size, and also the paralysis of the left vocal cord due to pressure on the left recurrent laryngeal nerve. Microscopic examination of the heart muscle showed it to be normal. Sections of the aorta and aneurismal wall showed only the usual changes.

DR. MESSENGER recalled the case of a similar, but much larger, aneurism, which on autopsy was found adherent to the spine and both chest walls, laterally and anteriorly. There had been a most distressing cough for several years. The patient died from interference with the respiration.

THE PRESIDENT remarked that such aneurisms need not necessarily pulsate, and that this specimen showed no fibrous bands or rough walls, a fact which might explain the absence of the murmur. He did not see why there should have been a systolic murmur at the apex.

#### A FLESHY MOLE.

DR. CHARLES N. DOWD presented a fleshy mole which was passed by a dispensary patient about two days after the uterus had been curetted. These moles are usually formed from foetal membranes which remain in the uterus after abortion or the death of a young foetus, extravasated blood aiding in their formation; or the retained placenta of an older foetus may form an entire mole. The so-called false moles may be produced from a submucous fibroid which becomes detached from its pedicle, from the mass expelled in membranous dysmenorrhœa, or from a simple blood clot. The patient who passed this mole gave the following history: She was thirty-six years of age, in fair general condition; denied ever having had syphilis. She had had five children, the last one three

years ago, and two miscarriages previous to the last child. She menstruated last on April 1st, and on August 1st had the ordinary signs of pregnancy. At this time she began to pass clots, and, although she looked for the foetus, found none. The hæmorrhages continued with more or less severity for four months, during the last two of which she was under observation at the dispensary. The mole was passed only after the uterus had been curetted, and thus the mole, which was the placenta of a four months' foetus, had been retained in the uterus for four months after abortion. On examining the specimen the following features were noted : It was an ovoid mass of firm consistence,  $2\frac{3}{4} \times 1\frac{1}{4} \times \frac{3}{4}$  inches in size. At the back there were some adherent membrane and a few dense clots. The rest of the surface was fairly nodular. Microscopical examination showed placental structure in a condition of interstitial inflammation. The placental tufts showed a large amount of dense connective tissue. Vascularity was much diminished. There were numerous calcareous deposits, and the entire structure was much compressed. The specimen was compared with a section of a normal placenta which was placed beside it. This interstitial placentitis is very common,<sup>1</sup> and it is certainly probable that it was the cause of the abortion.

Dr. Dowd also presented some other specimens illustrating other forms of moles. The first was a fleshy mole in which the membrane and decidua were found. Ziegler<sup>2</sup> says that this occasionally follows disease of the decidua or decidual hæmorrhage. Birch-Hirschfeld<sup>3</sup> says that the spaces between the chorionic villi are filled with coagulated blood, and that the chorion and amnion are sometimes bound firmly together by the clot.

The second false mole was really a submucous fibro-myoma, which in general appearance resembled closely the placental mole previously presented. These tumors extend into the uterine cavity and become separated and expelled. The separation is supposed to be caused by the constriction of the pedicle or the vessels of the pedicle, which comes from the efforts of the uterus to expel the mass. Another specimen was presented, showing the fibro-myoma in the uterus attached by a firm pedicle.

A discussion followed on the manner in which atrophy of the pedicle of the fibroid moles was brought about.

DR. M. P. JACOBI held that there was no diminution in the size of the uterus at the site of the pedicle, therefore no pressure was exerted around the pedicle.

THE PRESIDENT, as well as the reader of the paper, took the position that there was, notwithstanding this, a stenosis of the vessels

<sup>1</sup> Hirst : " American System of Gynæcology," vi., p. 243.

<sup>2</sup> " Spec. Path. Anat.," vii., p. 883.

<sup>3</sup> " Path. Anat.," vii., p. 802.

of the pedicle, caused very probably by the traction upon the mole, either from the efforts of the uterus to expel it or from its own weight.

#### TUBERCULOSIS OF THE LUNGS AND SUPRARENAL BODIES.

DR. H. M. BIGGS presented specimens showing these lesions, removed from the body of a man who had been admitted to Bellevue Hospital suffering from influenza. He had a general bronchitis, which cleared up well with the exception of several small areas of consolidation. His general condition became very good. Suddenly he grew worse, went into collapse, and was dead within five hours. The necropsy did not explain the cause of death. In both lower and upper lobes of the lungs there were six or eight small tubercular areas, surrounded by recent broncho-pneumonia. The bronchial glands were swollen, but not cheesy. There were no tubercles elsewhere, except in the suprarenal capsules, which were entirely replaced by cheesy masses. There was no pigmentation of the skin. Dr. Biggs was certain that these cheesy masses were tuberculous, although he had made no microscopical examination. He had seen two other cases of tuberculosis with lesions of the suprarenal capsules, and without pigmentation. One had tuberculous nodules in the cerebellum, cerebrum, kidneys, bladder, prostate, suprarenal capsules, and spleen, with a recent lesion in the lung. The other was a case of general miliary tuberculosis. He considered the real lesion in Addison's disease an affection of the sympathetic system. The lesions of the suprarenal bodies might be tuberculous, cancerous, hæmorrhagic, or occasionally atrophic.

DR. NORTHRUP had seen a case with dirty-brown skin, whitish cheesy bodies replacing the suprarenal capsules. The lesion was found to be hæmorrhagic.

DR. M. P. JACOBI said that she had always considered the lesion in Addison's disease a true atrophy. She suggested as the cause of the sudden death a generalized tuberculous infection not old enough to have caused lesions which were demonstrable.

THE PRESIDENT asked for examination of the pneumogastric nerves in cases such as this. There was probably no mechanical obstruction to the circulation in this case.

#### SUPERNUMERARY NIPPLE.

DR. MARY PUTNAM-JACOBI presented a specimen of a supernumerary nipple which was attached by a narrow and short pedicle to the summit of the normal nipple. It was of the same size as the normal nipple, and of the same structure, though the ducts were slightly more dilated. It had appeared at the age of thirty years, after the birth of a child, and had grown gradually during the past fifteen years up to its present size. It had caused no inconvenience

at all until the last two days, when there had been a little pain, probably from unusual pressure. Dr. Jacobi considered the case extremely rare.

DR. NORTHRUP had tied off a small growth from the summit of the nipple once, without thinking much about it. It may have been a similar growth.

#### BICUSPID AORTIC VALVE.

DR. H. M. BIGGS showed a bicuspid aortic valve. The valve had been perfectly competent, and the heart was not at all enlarged.

THE PRESIDENT had seen the aortic valve with four cusps, but had never seen one like this.

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#### *Stated Meeting, February 26th, 1890.*

DR. H. P. LOOMIS, VICE-PRESIDENT, IN THE CHAIR.

#### GENERALIZED TUBERCULOSIS HAVING ITS ORIGIN IN THE INTESTINE.

DR. WILLIAM P. NORTHRUP presented some specimens illustrating this condition, which were removed from the body of an infant which had died in the Foundling Asylum at the age of fifteen months. The child had been healthy up to the age of nine months, at which time it began to droop. Before death it had a cough, moderately high temperature, and diarrhoea. Upon autopsy the liver, spleen, and kidneys were seen to be tuberculous to a moderate degree, the lungs but little affected, and the brain and meninges not at all. Opposite the middle of the ileum, within the mesentery, were eight to ten large lymph nodes, closely grouped together; these were cheesy and had diffuent centres. The mesentery was somewhat shortened and thickened at this point, and the intestine was sharply doubled on itself, forming a knuckle, its contiguous walls being adherent. Two sinuses, having their openings in the legs of the knuckle, passed down into the thickened and contracted mesentery in a V-shape and terminated together in a cul-de-sac. A bent probe could be easily passed into one sinus, dipping down into the mesentery, and made to emerge at the other sinus. In this knuckle of ileum was a single ulcerated Peyer's patch, the ulcers having characteristic edges. Here, then, in immediate juxtaposition were ulcerated patch, old sinuses, thick and contracted cicatrix, cheesy and diffuent lymph nodes. No ulcer was observed in any other part of the ileum, and the enlargement of the mesenteric lymph nodes, apart from the group just described, was but moderate, and none were cheesy or tuberculous. The colon was the seat of extensive chronic catarrhal inflammation. Examination under



the microscope showed thickening of the mucosa and superficial necrosis of the epithelium. The large mesentery lymph nodes near the sinuses were found to be tuberculous. The only cheesy lymph nodes in the body were in the mesentery immediately about the cecum and old sinuses. The tubercles in the other organs were small and presumably recent.

DR. ELY asked whether anything was known about the nurse to whose care this child had been confided, and whether any examination had been made of her breasts; he also asked what was supposed to be the cause of death, whether it was not from exhaustion in consequence of the abscess; and finally he inquired if Dr. Northrup considered the abscess to have been primary.

DR. NORTHROP said that every effort had been made to ascertain something concerning the health of the nurse, but without success. The cause of death was thought at the time to be dysentery. In reply to the third question, the speaker thought that the abscess was primary.

DR. ELY said he thought that this case was of exceeding interest in the bearing that it had upon the etiology of tuberculosis. It was to be presumed that this child had never had anything in the way of nourishment, except breast milk. Many investigations had been made, both in this country and in Germany, to determine the conditions of the transmission of tuberculosis by means of milk, and some had maintained that the milk might contain tubercle bacilli even when there was no disease of the udder. Dr. Ernst claims to have found cases in which there were no lesions discoverable in the udder, and yet there were tubercle bacilli in the milk. It would therefore be exceedingly interesting to have accurate information concerning the health, and especially the condition of the breasts, of the nurse who had the care of this infant.

#### CARIES NECROTICA OF THE ASTRAGALUS.

DR. T. H. MYERS presented a specimen removed by operation from a child, three years old, eight months after a diagnosis of tuberculous synovitis of the ankle joint had been made from the symptoms present. The joint was not properly treated, owing to family reasons, and two months ago two sinuses opened on its inner aspect, through which carious bone was detected. The parents being unable and unwilling to carry out conservative treatment, operation was decided upon. Through lateral incisions the astragalus was shelled out of its cartilages and periosteum without the exercise of any force whatever. The cartilaginous surfaces appeared smooth, but the synovial membranes were pulpy. There were also extensive deposits of tubercular granulations beneath the anterior tendons, and on both lateral aspects of the joint. From the specimen it would seem that the disease was originally peripheral. The



specimen also showed the necessity of a radical operation, if any were attempted.

#### SUBDURAL HÆMORRHAGE.

DR. E. D. FISHER presented a specimen of extensive subdural hæmorrhage which had given rise to few or no symptoms. The specimen was removed from the body of a man who had died of general tuberculosis. Twenty years before his death he had received a blow fracturing the frontal bone, but recovered perfectly, and was able to return to his work in eight weeks. Upon removing the skull a mass was seen beneath the dura mater, covering and pressing upon the greater part of one side of the cerebrum, involving the face and mouth centres. It was interesting that such an extensive meningeal hæmorrhage could have occurred, becoming encysted and organized without exciting any symptoms of a permanent nature.

#### THROMBOSIS OF THE CEREBRAL SINUSES.

DR. FISHER presented a second specimen, that was removed from the body of a woman who had been under treatment for what was supposed to be acute mania. But little was known of the woman's previous history, further than that she had been addicted to the immoderate use of alcohol. The symptoms were the ordinary ones of acute mania, except that there had been no rise of temperature before death, as is so common in these cases. Upon autopsy all the organs were found to be normal, with the exception of the heart. The walls of the right ventricle were rather thin, though the speaker was not certain that this was a pathological condition. The pulse had been found to be somewhat intermittent and feeble toward the end of the patient's life. In the brain a thrombosis was found, involving almost all the sinuses and also of the veins entering into the brain. This thrombosis was undoubtedly of ante-mortem formation. The finding of this very extensive thrombosis in connection with symptoms of acute mania was interesting, as Dr. Fisher did not know of any signs by which the presence of this intracranial condition could be diagnosed. The speaker doubted whether the woman had acute mania, but believed that the symptoms were caused by an interference with the return circulation from the brain.

DR. NORTHROP had seen two cases of thrombosis of the longitudinal sinus occurring in children. In one of the cases the mother of the infant was suffering from puerperal fever. In both cases the circulation was very weak.

DR. LOOMIS said that it was not uncommon to find thrombosis of the longitudinal sinus, and he had never attached any special significance to the condition. They are usually considered to be ante-mortem in their occurrence, being formed just before death.

DR. FISHER said that the autopsy in this case was witnessed by several persons, and all regarded the thrombosis as having occurred some time previous to death. In this instance the mania would be accounted for by the lesions found post mortem, but he did not believe that it would have been possible to diagnose the condition before death. The post-mortem findings in acute mania were not usually satisfactory, and there was nothing which could be called characteristic of the disease.

DR. LOMIS said that he had been called upon some time ago to make a very careful examination in a case of acute mania, and he had found absolutely nothing except capillary congestion.

#### PERFORATING TYPHOID ULCER.

DR. JOHN S. ELY presented a specimen, for which he was indebted to Dr. J. S. Thacher, removed from the body of a boy nineteen years of age. He was admitted to St. Luke's Hospital on December 28th, 1889, complaining of symptoms pointing to typhoid fever. From that time his disease ran the regular course of a mild case of typhoid fever, the temperature reaching a maximum on the sixteenth day, and coming down to normal on the twenty-fifth. The next day it began again to rise regularly, and in four days reached 105° F., when it became evident that he had a relapse. Ten days the temperature rose with a chill to 105° F. in the morning, and then rapidly fell to 102° F., the patient evincing much shock. Tympanites and tenderness, pain in the abdomen, repeated vomiting, thoracic respiration, and disappearance of dulness over the liver, all rapidly developed. These symptoms continued for two days, when the temperature rose to 107° F., and the patient died of exhaustion.

At the autopsy typhoid ulcers were found in the ileum, one of which, situated about a foot above the ileo-cæcal valve, was found to have perforated and given rise to a general peritonitis.

Peritonitis occurring as a complication of typhoid fever, Dr. Ely said, is of one of two varieties: it may occur as a result of perforation of the gut, as in the present instance, or independently of any such perforation. The source of the latter, the so-called idiopathic complicating peritonitis, has given rise to much speculation. A study of the complications of typhoid fever has shown that many of them are caused by the typhoid bacillus. Thus the bacillus has been found by various observers in the following diseases complicating this affection: lobar pneumonia, orchitis, abscess of the leg, peritonitis, nephritis, empyema. Finally, A. Fränkel reported a case of typhoid fever in which two attacks of localized peritonitis occurred as complication and sequela, with the subsequent formation of an abscess in the pus, from which no other micro-organism than the typhoid bacillus could be found either morphologically or by culti-

vation. All this suggests strongly the possibility that in certain cases the peritonitis complicating typhoid fever may be caused by the typhoid bacillus. We should naturally expect this to occur in a much larger proportion of cases of peritonitis without perforation than of cases with perforation, since the latter condition permits of the escape into the peritoneal cavity of so many other inflammation-producing agents (most of them more rapidly acting) from the interior of the gut. In view of the possibility of the typhoid bacillus setting up purulent inflammation, search was made for it in the present case both in the ulcerated Peyer's patches and in the peritoneal exudate, but, unfortunately, sufficient time had elapsed after death for putrefaction bacteria to invade the tissues in large numbers, and the question as to the etiology of the peritonitis must, therefore, be left uncertain. The late occurrence of the perforation, on the thirty-ninth day, and its happening in the course of a relapse, are interesting features of the present case.

#### INTUSSUSCEPTION OF THE ILEUM IN AN ADULT.

DR. H. S. STEARNS presented a specimen removed from the body of a woman twenty-seven years of age. She was pregnant, and entered hospital January 29th, complaining of pains in the abdomen, but these ceased later in the day. She had a persistent cough, and two days after admission a profuse diarrhoea set in. About three o'clock on the morning of February 3d she was delivered of a dead foetus six or seven months old. Everything progressed favorably until ten o'clock that morning, when the woman began to show signs of shock, and failed rapidly in spite of active treatment, and died the same afternoon. During the entire time that the patient was in the hospital she had a weak and rapid pulse and a temperature of 101° F. At the autopsy there was found to be consolidation of the upper half of both lungs, due to miliary tuberculosis, and there were several tuberculous ulcers in the ileum and jejunum. An intussusception was found in the ileum about eight inches above the ileo-caecal valve. The invagination proceeded from below upward, about four inches of the gut being involved. There was complete occlusion.

#### A NEW BACILLUS FOUND IN THE AIR.

DR. J. M. BYRON presented some cultures of a new bacillus which he had found in the air. The bacillus gave a red culture in all media. Spectroscopic examination gave one broad line between E and D, and another far over toward the violet.

#### RÉSUMÉ OF THE REPORTS ON THE ETIOLOGY OF INFLUENZA.

DR. C. N. DOWD read the following résumé:

The recent advances in methods of study and in our knowledge

of the cause of disease have been so great that we turn with much interest to the reports of those who have tried to find the cause of influenza.

There has been so much material to study that many pathologists and bacteriologists have been able to make extended investigations. The solid tissues, the blood, and the various secretions and exudations have been studied; microscopical, culture, and inoculation methods have been used. The results of this labor have been great, although no single cause for the disease has been given and accepted.

I wish to present a short résumé on the main results so far recorded, and to record the negative results of some very limited observations by myself.

*Examinations of Blood.*—Many observers have studied the blood of influenza patients. Klebs<sup>1</sup> found in fresh blood from the finger tips masses of small, actively moving bodies, of high refractive power; these bodies are similar to those which he has seen in the blood of pernicious-anæmia patients. In fluid blood taken from the heart of an influenza patient two hours after death he found oval monads 2 to 4.5  $\mu$  in length and 1 to 3  $\mu$  in breadth, the smallest forms showing quivering movements and locomotion, the larger showing light peristaltic contractions. They were stained with a five-per-cent solution of methylene blue in physiological salt solution, and as the movements ceased flagellæ were evident. Most of these bodies were within the red corpuscles, often two to five in a single corpuscle.

Kollmann<sup>2</sup> reports having found in fresh unstained blood from the finger tips actively moving bodies—oval, round, or rod-shaped—the larger rod-like forms occasionally showing protuberances on the ends, and so approaching dumb-bell forms. Occasionally the bodies were joined together like diplococci. A few were so small that their form could not be well made out. He does not consider these bodies to be necessarily abnormal, as he has seen similar ones in the blood of healthy persons; he thinks they correspond closely to the monads described by Klebs. He did not find the flagellate forms in the corpuscles.

Further reports on the blood are given. Klebs<sup>1</sup> reports plate cultures from the blood of two patients who died from influenza. There were no bacterial growths. Weichselbaum<sup>3</sup> examined the blood of two influenza patients; it was taken by venesection and examined microscopically; agar plates were also made. The result was negative.

<sup>1</sup> Klebs, E.: *Centralblatt für Bakteriologie und Parasitenkunde*, January 24th, 1890.

<sup>2</sup> Kollmann, A.: *Berliner klin. Wochenschrift*, February 17th, 1890.

<sup>3</sup> Weichselbaum: *K. k. Gesellschaft der Aertze zu Wien*, January 31st, 1890; reviewed in *Deutsche Med. Wochenschrift*, February 13th, 1890.

Finkler<sup>1</sup> aspirated blood from the spleen, and found streptococci but no other bacteria after culture.

Vaillard and Vincint<sup>2</sup> found streptococcus pyogenes in the blood. Sée and Bordas<sup>3</sup> report negative blood examinations.

Laveran<sup>4</sup> reports negative blood examinations.

The writer examined blood from the finger tips of ten influenza patients; the specimens were dried in thin layers on cover glasses, and were stained with methylene blue, as in the examination for plasmodium malariae. The results were entirely negative; nothing abnormal was found. Nine of the patients had mild symptoms; their blood was taken on the third to sixth day of the disease—usually on the third day. The tenth was confined to bed with severe constitutional symptoms; his blood was taken on the second day. I also planted the blood of two of the patients on agar plates, and kept them at the body temperature. There were no growths.

The results of these blood examinations are only suggestive. Klebs' reports have not yet been confirmed. Kollmann does not believe that the organisms which he found were pathological. The other observers found bacteria which exist in other parts of the body, or they found nothing.

*Bacterial Studies of Secretions, Exudations, and Viscera.*—Many bacterial studies have been made from the lungs and other viscera, from the sputum, tracheal and nasal mucus, pleuritic exudations, etc. These studies have resulted in the announcement of various bacteria as the prevailing types, different observers giving different results.

The diplococcus pneumoniae of Fraenkel-Weichselbaum and streptococcus pyogenes were the most common forms.

In the following reports *diplococci* were the prevailing bacteria.

Prudden<sup>5</sup> studied six cases of pneumonia complicating influenza. In one, which was fatal, he examined the lungs, in the other five he examined the sputum. In the lung he found a pure culture of diplococcus pneumoniae in enormous numbers. In the sputum of four cases he found diplococcus pneumoniae in enormous numbers and many staphylococcus pyogenes aureus; in one of them there was also streptococcus pyogenes.

In the fifth sputum specimen there were very large numbers of streptococcus pyogenes and staphylococcus pyogenes aureus. There were scattering forms in all the sputum specimens.

<sup>1</sup> Finkler: Deutsche Med. Wochenschrift, January 30th, 1890.

<sup>2</sup> Vaillard and Vincint: Bulletin Médical, January 25th, 1890; reviewed in Münch. Med. Wochenschrift, January 28th, 1890.

<sup>3</sup> Sée and Bordas: La Médecine Moderne, No. 6; reviewed in Münch. Med. Wochenschrift, February 4th, 1890.

<sup>4</sup> Laveran: Le Bulletin Médical, No. 8; reviewed in Deutsche Med. Wochenschrift; also Berliner Med. Wochenschrift, February 6th, 1890, and February 17th, 1890.

<sup>5</sup> Prudden: Medical Record, February 15th, 1890.



Thus in five out of six cases of pneumonia the diplococcus pneumoniae was the prevailing bacterium; in all cases it was identified by animal inoculation and by culture on agar plates.

Weichselbaum examined the sputum of eighteen patients: fifteen of them simple, uncomplicated influenza; one with a complicating broncho-pneumonia; two had a croupous pneumonia later. The sputum was collected on the second day after admission to the hospital. In all cases there were many bacteria; these were almost exclusively diplococci, which were nearly identical with diplococcus pneumoniae, but showed less virulence on animal inoculation.

Only twice did he find streptococcus pyogenes and twice staphylococcus pyogenes aureus associated with them. He also found this diplococcus in the urine. In ten autopsies on cases of simple influenza, and influenza with complications, he found inflammation in the frontal sinuses and antra of Highmore nearly constant; in the most severe cases they were filled with pus. In this pus microscopical examination and culture both showed diplococcus pneumoniae, which was especially virulent on inoculation. Once he found streptococcus pyogenes and once staphylococcus pyogenes aureus associated with the diplococcus. In three cases of otitis media and seven cases of croupous pneumonia he found diplococcus pneumoniae; also in the pus from a leptomeningitis and abscess of the brain, and once in the intestinal contents.

Levy<sup>1</sup> studied eighteen cases with the following results:

*Exudation in otitis media* (usually purulent), seven cases.

Result: Diplococcus pneumoniae of Fraenkel - Weichselbaum (pure culture), six cases

Diplococcus pneumoniae and staphylococcus pyogenes albus, one case.

There had been a discharge from the ear in the last case for several days.

*Pus from chest in empyema*, five cases.

Result: Diplococcus pneumoniae (pure culture) in every case.

*Sero-purulent pleuritic exudation*, one case.

Result: Diplococcus pneumoniae (pure culture).

*Serous pleuritic exudation*, three cases.

Result: Diplococcus pneumoniae (pure culture), one case.

Diplococcus pneumoniae and staphylococcus pyogenes albus, one case.

Staphylococcus pyogenes albus (pure culture), one case.

*Material aspirated from lung in broncho-pneumonia*, number of cases not stated.

Result: Diplococcus pneumoniae, one case.

*Lung and pleuritic exudation lobular pneumonia* (autopsy), one case.

Result: Diplococcus pneumoniae.

<sup>1</sup> Levy, E.: Berliner klin. Wochenschrift, February 17th, 1890.



Thus, in the eighteen cases examined, diplococcus pneumoniae of Fraenkel-Weichselbaum was the predominant form seventeen times, and staphylococcus pyogenes albus was the predominant form one time.

Jolles<sup>1</sup> reports from the sputum and urine of influenza patients in Vienna a diplococcus very similar to diplococcus pneumoniae.

Sée and Bordas<sup>2</sup> examined cases of fibrinous pneumonia after influenza, number not stated in review; in all cases they found lancet-formed diplococcus.

In these five series of observations, Prudden, Weichselbaum, and Levy announced definitely that the diplococcus pneumoniae of Fraenkel-Weichselbaum was the form found; as to the other two, we are left somewhat in doubt.

The following reports have been made where streptococcus pyogenes was the prevailing form:

Ribbert<sup>3</sup> made bacterial examinations from seven fatal cases of influenza; five with pneumonia, two without it. In five cases streptococcus pyogenes was the only characteristic micro-organism. Staphylococcus pyogenes aureus was occasionally associated in moderate numbers. In one of the non-pneumonic cases he found a pure culture of streptococcus pyogenes in great numbers; in the tracheal mucus he found it associated with staphylococcus and other bacteria. A similar condition was found in one of the pneumonic cases. He examined three spleens and three kidneys; the results were negative, excepting in one spleen, where he found streptococcus. In the sputum he regularly found numerous streptococci. In two of the pneumonic cases he found no micro-organisms. The pneumonococcus was not found in any case.

Finkler<sup>4</sup> made bacterial examinations in influenza-pneumonia cases as follows: Lung, spleen, and other parts of body, post mortem, two cases; lung by aspiration, six cases; sputum, twelve cases; pus from otitis media complicating pneumonia, two cases.

*Results.*—In all pneumonic lungs streptococcus pyogenes. In one pneumonic lung a staphylococcus and a diplococcus which differed essentially from the diplococcus pneumoniae (Fraenkel's). In two pneumonic lungs a large bacillus (not Friedländer's bacillus pneumoniae). In the sputum he found the streptococci in all cases but two. Generally staphylococcus aureus or albus was associated; bacilli a few times; diplococci twice. In pus of otitis media, one case, a pure culture streptococcus pyogenes; one case streptococcus

<sup>1</sup> Jolles: Wiener Med. Blätter, No. 4; reviewed in Münch. Med. Wochenschrift, January 28th, 1890.

<sup>2</sup> Sée and Bordas: La Médecine Moderne, No. 6; reviewed in Münch. Med. Wochenschrift, February 4th, 1890.

<sup>3</sup> Ribbert: Deutsche Med. Wochenschrift, January 23d, 1890.

<sup>4</sup> Finkler: Deutsche Med. Wochenschrift, January 30th, 1890.

pyogenes and staphylococcus pyogenes albus. He also reports having found the same streptococcus in cases of bronchitis with influenza, and in the pericardium and the spleen.

Vaillard and Vincint,<sup>1</sup> Hôpital de Grâce, Paris, found streptococcus pyogenes in all examined cases in the blood, spleen, lungs, and pleuritic exudation; in three cases it was in pure culture; once staphylococcus pyogenes was associated; they also found streptococcus in the sputum.

Prudden<sup>2</sup> examined the sputum of three cases of bronchitis complicating influenza. In two there were large numbers of streptococcus pyogenes; in the third there were large numbers of diplococcus pneumoniae; in all there were a few scattering forms.

Laveran<sup>3</sup> found in sputum of many cases streptococcus pyogenes very abundant.

Du Casal<sup>4</sup> found it constant in the sputum of fourteen cases of influenza.

We thus find six series of observations in which streptococcus pyogenes was the predominant form.

Babes,<sup>5</sup> in Bucharest, examined the nasal secretion, and sometimes the sputum, of nine influenza patients. He made numerous agar plates and animal inoculations, and separated the different species of bacteria with much care. In five of the cases the predominant form was a bacillus which he designates Bacterium II.; another form, which he calls Bacterium I., was found in four cases, often associated with Bacterium II. These forms he announces as new ones, and suggests that they may be a pathological element in the disease. He also found numerous other forms; he only found streptococcus pyogenes in one primary case of influenza. In secretions of patients suffering from the sequelæ of influenza he found many forms of bacteria, but announces none as predominant.

Bouchard<sup>6</sup> found in secondary affections three different forms—staphylococcus pyogenes aureus, pneumonococcus, and streptococcus pyogenes.

*Conclusions.*—If we review these results we find that in three series of observations, embracing about thirty cases, diplococcus pneumoniae of Fraenkel-Weichselbaum was the predominant form; in six series, embracing sixty or more cases, streptococcus pyogenes was the predominant form; in four series the reports leave us some-

<sup>1</sup> Vaillard and Vincint: Bulletin Médical, January 25th, 1890; reviewed in Münch. Med. Wochenschrift, January 28th, 1890.

<sup>2</sup> Prudden: Medical Record, February 15th, 1890.

<sup>3</sup> Laveran: Le Bulletin Médical, No. 8; reviewed in Deutsche Med. Wochenschrift; also Berliner Med. Wochenschrift, February 6th, 1890, and February 17th, 1890.

<sup>4</sup> Du Casal: Le Bulletin Médical, No. 8; reviewed in Deutsche Med. Wochenschrift, February 6th, 1890; also Berliner Med. Wochenschrift, February 17th, 1890.

<sup>5</sup> Babes, V.: Centralblatt für Bakteriologie und Parasitenkunde, February 17th, 1890.

<sup>6</sup> Bouchard: Sém. Méd., No. 5; reviewed in Münch. Med. Wochenschrift, February 4th, 1890; also, Berliner Med. Wochenschrift, February 17th, 1890.

what in doubt about the predominant form. Both the diplococcus pneumoniae and streptococcus pyogenes were found in the lungs, sputum, and other secretions, and in various exudations, and each was many times found in pure culture—*e.g.*, in the pus in otitis media Finkler finds pure growths of one, and Levy finds pure growths of the other. Both of these forms are found in the mouth and air passages in health, or conditions of slight disease, and they seem ready to set up their action when inflammation provides a suitable medium for growth. The general belief is that they have not been the cause of the influenza, but that they have developed as the influenza has provided them with a suitable condition for growth, and that their development may have caused some of the complications.

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*Stated Meeting, March 12th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

TUBERCULAR PERITONITIS WITH LATENT SYMPTOMS.

DR. L. EMMETT HOLT presented some specimens removed from a boy two years of age, with the following history :

The patient had been under observation in the Babies' Hospital, where he was admitted two days before death. The father was reported to be sick with pulmonary tuberculosis in Charity Hospital. There was no history of tuberculosis in other members of the family. The child was stated to have been well until an attack of pneumonia, three months before, from which he had never fully recovered. He had continued to cough and lose flesh, and had not been able to walk about. During the last few weeks enlargement of the abdomen had been observed. On admission there were found the evidences of rickets quite well marked, the tongue was coated, cervical glands slightly enlarged, but no change in any other external glands. There were signs of partial consolidation throughout the left lung, particularly behind and in the lower portion. The abdomen was much enlarged and everywhere tympanitic, but there were no evidences of fluid, and no pain or tenderness even on deep pressure. There was no enlargement of the spleen or liver. The superficial veins were not enlarged. There was moderate cachexia. The boy was poorly nourished and small for his age, weighing but eighteen pounds. During the time that he was under observation he lost steadily in weight. The stools were never more than three in number in the twenty-four hours, but all contained a good deal of mucus and were foul-smelling, though they contained no blood. There was no vomiting, and the boy appeared to digest his food well. The rectal temperature ranged from 98.4° to 99.4° F., never rising above the latter point

until within a few hours before death, when it reached 100.2°. The child coughed rarely. There were never any evidences of pain. The child lay or sat quietly in his crib, usually listless and indifferent to his surroundings. He had the appearance of a child suffering from malnutrition, but nothing more. The prostration gradually increased, and finally passed into collapse, in which the child died.

*Autopsy.*—The brain was not examined. The left lung was generally adherent both to the chest wall and to the diaphragm; the adhesions were firm, old, and organized, but there were no tuberculous deposits in the pleura. In the lower part of the upper lobe, and in the whole of the lower lobe, there were very many large and small tubercular nodules, some of which were broken down; considerable new connective tissue was present. The right lung was slightly emphysematous, but in general nearly normal, except that a few tubercular nodules, small and widely scattered, were found; there were no adhesions. The bronchial glands were enlarged and cheesy, and some were broken down. The heart and pericardium were normal.

Both the visceral and parietal layers of the peritoneum were universally involved. The omentum was from one-eighth to one-sixth of an inch thick, firmly adherent both to the abdominal wall and to the intestines, and filled with tubercular deposits. All the intestinal coils were firmly united by not very old plastic product, which could be easily separated. The liver was so firmly adherent to the diaphragm that its substance was torn in removing it. The spleen was likewise bound in position. No portion of the peritoneum seemed to have escaped, and in the exudation everywhere were very extensive tubercular deposits. Several small pockets were formed between the adhesion, which contained brown turbid serum; about half a pint in all was collected from the abdominal cavity. The liver was moderately fatty, and contained no tubercles except upon its surface. It did not respond to the iodine test for amyloid degeneration. The spleen was firm and not enlarged; a very few tubercular deposits were seen on section. The kidneys were normal.

The small intestine contained great numbers of tubercular ulcers, the largest less than an inch in length, extending transversely in the gut. In several places these had extended to the peritoneal coat, and one had possibly perforated during life, although the adhesions were so firm and so abundant that the tear might have been accidental. The ulcers were generally situated in Peyer's patches. The large intestine contained no ulcers, and its mucous membrane was essentially normal. The mesenteric glands were all enlarged and cheesy, and some were beginning to soften. None was larger than half an inch thick and one inch in diameter.



The special points of interest about this case were, in the first place, the absence of symptoms with so extensive a pathological process. All the usual symptoms, such as pain and tenderness, fever, ascites, and the presence of abdominal tumors, were wanting. Dr. William Osler, in his excellent monograph upon this subject (Johns Hopkins Hospital Reports, vol. ii., No. 2, 1890), calls special attention to the frequency with which tubercular peritonitis has been found at the autopsy, or during abdominal sections, when it had never been suspected. In the case reported it does not seem possible to have made a diagnosis. A second point of interest was the extent to which the peritoneum was involved, without any very recent process in other parts of the body. Of the three hundred and fifty-seven cases collected by Dr. Osler, only twenty-seven were in children under ten years of age, so that the disease cannot be said to be very often seen at this time of life. The speaker had seen two other cases of the disease in young children, but never before such a generalized form as in the case presented.

DR. J. S. ELY thought that the point of entrance of the tubercle bacilli had been the lungs, as is the rule in these cases. This opinion was strengthened by the clinical history, as the first symptoms of any sickness in the child were referable to pulmonary trouble. He believed that tubercular sputum had been swallowed by the child, and had given rise to the peritoneal disease after absorption from the intestine. One of the most difficult things to explain, if this is the sequence in these cases of tubercular peritonitis, is the absence in many cases of any very extensive tuberculous lesion of the intestine. This was a feature of the present case. The peritoneal lesion was very marked, while in the intestine only a few small ulcers were visible. An explanation which had just suggested itself to the speaker, and which he would offer as little more than a suggestion, was the following: We know that in milk-fed children the contents of the alimentary tract throughout its whole extent are acid. In adults, and in children fed upon a mixed diet, the contents of the duodenum, jejunum, and upper part of the ileum are undoubtedly alkaline, but in the lower part of the ileum they have been found to be frequently acid. This is the location of Peyer's patches and of the solitary follicles, through which it is customary to suppose the tubercular bacilli to be taken up. Now, it is a well-known fact that the tubercle bacilli do not grow upon acid media. While in the intestine, and while in Peyer's patches, bathed constantly by the acid contents of the intestine, may they not be checked in their development until they have been carried beyond their incompatible surroundings into the alkaline medium of the lymphatics and blood current? Then they would have every opportunity to develop.

DR. H. M. BIGGS said that an argument against this theory

seemed to him to exist in the extensive tubercular ulceration of the gut so often found in cases of phthisis.

DR. ELY replied that, on the contrary, this was rather confirmatory than otherwise, as the contents of the small intestine have been shown only occasionally to be acid, in the majority of cases being alkaline when the person is on a mixed diet. It is because cases like that presented by Dr. Holt are the exceptions that they need explanation, and the acidity of the contents of the intestine is the exception also. Another point in substantiation of this theory was the great rarity of tuberculosis of the colon and rectum, where the secretion is acid and the reaction of the fæces is also acid.

#### ABNORMAL POSITION OF THE VERMIFORM APPENDIX.

DR. J. S. ELY presented two specimens which had been sent to the Museum of the College of Physicians and Surgeons within the past two days, showing an abnormal position of the appendix. In one case it was coiled up along the cæcum and hidden by the ileum, so that only its proximal end was visible. In the second specimen the vermiform appendix was not visible at all, and was distinctly retroperitoneal. The specimens were interesting in connection with cases of appendicitis in which there is a retroperitoneal abscess instead of a peritoneal one. He had once seen a similar specimen in which there were two perforations, but no peritonitis.

#### URINE WITH HIGH SPECIFIC GRAVITY.

DR. J. H. LINSLEY reported a case in which the urine had a very high specific gravity. The patient was a woman, twenty-five years of age, whose mother had died of heart disease, her father, three brothers, and one sister of phthisis. She herself had always enjoyed good health. She was first seen on February 23d, at which time she had been sick for two weeks. She complained of headache, anorexia, dulness, and general malaise. There had been no marked chill. During several days the temperature ranged from 101.5° to 104.5° F., and the pulse from 112 to 120. The urine was examined three days later, with the following result: Reaction, acid; color, reddish-yellow; odor, fetid; consistence, limpid; specific gravity, 1.050. It was cloudy and had a white or slightly flesh-colored precipitate. The quantity of urea was 0.0033 gramme per cubic centimetre, or 3.3 per cent. The chlorides were diminished, while the phosphates were enormously increased. Microscopical examination showed pavement epithelium, uric acid, amorphous phosphates, and the ordinary bacteria. The interest in the case centred in the high specific gravity, with the proportionally small amount of urea. Supposing the quantity of urine voided to have been fifteen hundred cubic centimetres, taking into consideration the specific gravity and the absence of sugar, the



quantity of urine would have been forty-nine grammes, the normal quantity being thirty to forty grammes for the twenty-four hours. The exact quantity of urea was not known, but it was considerably below the normal. Another curious fact was the presence in the same precipitate of uric acid and amorphous phosphates. The excess of phosphates (which formed the precipitate) could be cleared up by adding a few drops of nitric acid; while upon the addition to the urine of a small quantity of liquor potassæ or ammonium hydrate, an enormous quantity of phosphates was precipitated. Dr. Linsley said that he had not had time to consult the literature on the subject to determine the rarity of this case, but in three thousand consecutive examinations of urine he had never seen any such condition as this, and on consulting with several pathologists he had ascertained that they had never observed any specific gravity as high as this in urine free from sugar. The specific gravity was taken not only with a urinometer carefully tested and corrected, but also with a Mohr-Westphal balance at 15° C. Since the time when the urine was examined first, up to the present, the patient's temperature has ranged from 100° to 104° F., and her pulse has always been above 100. She has had no eruption on the abdomen, and no marked symptoms of typhoid fever—in fact, an examination of all the organs gave a negative result. The specific gravity of the urine has not fallen as yet below 1.030 in any one specimen examined, and the excess of phosphates has continued.

In reply to a question whether any investigation had been made to determine the quantity of ash, Dr. Linsley replied that there had not.

#### PRIMARY CARCINOMA OF THE GALL BLADDER.

DR. H. P. LOOMIS presented a liver removed the previous afternoon from the body of a woman aged forty-six, who had been in excellent health until about four months ago, with the exception of an attack, two years before, which had been diagnosed as "gall stones." This sickness lasted two weeks, and the woman made a good recovery. Four months ago she began to have pains in the region of the liver, accompanied by nausea, vomiting, loss of appetite, and progressive emaciation. About one month ago the attacks of pain became more frequent and more severe, and extensive jaundice developed. The urine contained bile, a small amount of albumin, and granular casts. The patient grew steadily weaker, although the nausea and vomiting were not marked at this time, and nourishment was easily retained. Various diagnoses of cancer in different organs were made by various physicians. No tumor was at any time appreciable, but the patient had the characteristic cancerous cachexia well marked.

*Autopsy*—The stomach was not dilated, no obstruction at the pylorus was found, and the mucous membrane presented the appearances of subacute gastritis. The gall bladder was entirely obliterated, and its place was occupied by a cancerous mass the size of a small apple, in the centre of which were half a dozen gall stones. Continuous with this was a second cancerous mass which extended upward and backward into the right lobe of the liver, nearly to its upper surface. There were no nodules in any other part of the liver, which was itself not enlarged, and the changed gall bladder was so concealed by the free border of the organ that it would have been impossible to diagnose its condition during life. Microscopical examination of a section, cut so as to include the nodules and some liver tissue of normal appearance, showed that the cancer cells followed the capillaries in between the liver cells, and collections of cancer cells were seen in sections of the larger bile ducts. The points of special interest in the case were: 1. The primary development of cancer in the gall bladder and the non-involvement of the stomach and pancreas. 2. Although the extension of cancer into the liver was, without question, principally by continuity, still the finding of bile ducts filled with epithelioid cells beyond the cancerous area would suggest that these biliary passages also furnished channels for the advance of the cancer cells. 3. The question of the causal relation in which gall stones stand to the development of cancer of the gall bladder is brought up by this case. Dr. Loomis said that he believed, basing this opinion on clinical experience, that most cases of cancer of the gall bladder give a history of repeated attacks of biliary colic extending possibly over a number of years.

#### ACUTE EXUDATIVE ENDOCARDITIS.

DR. LOOMIS also presented a heart removed from the body of a woman, aged twenty years, who had died in Bellevue Hospital. She had been admitted with the symptoms of severe cardiac disease. The dyspnoea was so intense that she was unable to lie down. Her previous history was unobtainable, as she could not speak any English. During the ten days that she was in the hospital her temperature ranged between 102° F. and 105° F., the pulse was about 128, and the respirations were from 34 to 50. Physical examination of the lungs showed labored breathing, about normal pulmonary percussion, feeble and harsh respiratory murmur on both sides of the chest, and a few moist râles at the base of both lungs. At no time did she have a cough. Four days after admission the physical examination revealed the presence of fluid in the right pleural cavity, and this was confirmed by means of the exploring trocar. A needle being introduced again, a large syringeful of clear blood was withdrawn. Examination of the heart revealed a loud-blowing, mitral,

regurgitant murmur, conveyed to the left and heard behind between the fifth and eighth dorsal vertebræ. Examination of the urine did not give any evidence of disease of the kidneys.

*Autopsy.*—The left ventricle of the heart contained a mass of partly-coagulated blood, presenting the appearance of an ante-mortem clot. The mitral valve was almost entirely destroyed. Vegetations, the size of small olives, projected from the valvular flap, and an ulcer, the size of a ten-cent piece, had eaten completely through one of the leaves of the mitral valve. The vegetations were soft and had all the appearance of being recent, and presented irregular wreaths enclosing the attachment of the chordæ tendineæ. Microscopical examination of sections cut so as to include the vegetations and part of the valve, and stained according to Gram's method, showed no bacteria. The heart wall and the other valvular orifices were normal. There was no fluid found in either pleural cavity, so that the syringe-ful of clear blood that was withdrawn must have come from the needle piercing the congested lung. Both lungs had a pale-grayish, leathery appearance under the microscope, and showed scattered patches of catarrhal pneumonia, with intense congestion of the intermediate portions. The liver was of normal size, and showed the lesions of passive congestion. The kidneys presented the same changes. In the spleen, which was slightly enlarged, there was an infarction about the size of a large olive. From a careful examination of the cardiac lesion, Dr. Loomis said that he believed the process was acute from the beginning, and not an acute process engrafted upon a chronic one. No evidences of the bacterial origin of the endocarditis could be found either in stained sections of the destroyed valve or in cultures made in gelatin. Another interesting point in the case was the rapid disappearance of the serum, which was demonstrated, not only by physical examination, but also by the exploring trocar, to have half-filled the right pleural cavity.

Dr. BIGGS, referring to the first case, believed that the cancer had extended chiefly by continuity, and did not think that the bile ducts were the channels of its extension.

In regard to the second case, he thought that there were no such forms of endocarditis occurring without the presence of micro-organisms. He had always found some forms of pathogenic micro-organisms in these cases, and it seemed to him entirely impossible for anything else to excite an inflammation with destruction of tissue in a serous membrane. When we have destruction and ulceration, he believed that we must have the presence of micro-organisms.

THE PRESIDENT said that he thought there was a tendency to attribute a little too much to the action of micro-organisms, and to assume that they must necessarily be present in every case. He

believed thoroughly in the pathogenic action of bacteria, yet it seemed to him that when a competent observer has tried to obtain cultures, and has made many sections in any particular case, but has found no bacteria, we ought to accept the evidence as reliable. A point of interest in the case was the fact that serum had been found in the chest at one time, and that it had disappeared not very long after. It showed how quickly serum might be absorbed at times.

DR. MYERS asked how much serum one might expect to find in the lung, and whether if we drew a drachm we would say that that was more than could be obtained from the lung alone. He had several times drawn thirty or forty minims of bloody serum in children, and after death he had been unable to discover any signs pointing to a previous exudation of serum in the pleural cavity.

THE PRESIDENT said that he did not know how much serum might be drawn from the lung during life, but he had found it very difficult to get any appreciable quantity in this way after death.

#### RACHITIS—PACHYMENINGITIS INTERNA HÆMORRHAGICA.

DR. WILLIAM P. NORTHRUP presented some specimens and microscopic sections removed from the body of a male child, aged twenty-three months, admitted to the New York Foundling Asylum at the age of one week, in "fair condition." It was put out to nurse, and returned to the Asylum in wretched condition, anæmic and emaciated. There were râles over both chests, the abdomen was prominent, the spleen was so large that it could be plainly felt. There were no signs of syphilis, and no convulsions or other symptoms of brain trouble.

*Autopsy.*—The body was emaciated, abdomen flabby and prominent, rachitic rosary well marked, epiphyses of the long bones not especially enlarged. On removing the skull the dura mater was found adherent to the bone, there was hemorrhage into its layers, and at the vertex more or less exudate upon its surface (pachymeningitis interna hæmorrhagica). The lesion was extensive, most marked at the vertex, and extending continuously to the base, where it gradually faded out. The least marked lesions were simple punctate hæmorrhages within the substance of the dura; the most extensive lesion was the exudate upon the surface, rather thicker than blotting paper. There were no thrombi in the sinus. There was extensive broncho-pneumonia (recent) in the left lung, and some marginal consolidation in the right. There were no cheesy masses in the lungs, though the glands were slightly swollen. The liver was enlarged and pale, but not fatty. The spleen was four or five times its natural size, and on section was dry and glistening, not waxy. There was no prominence of the Malpighian bodies.

The kidneys were pale and the markings were distinct. The heart was flabby, and the foramen ovale was slightly open, but the ductus arteriosus was closed. The femur, when sawn longitudinally, showed an irregular line of ossification at the lower end of the shaft, at its juncture with the cartilage. There was an irregular bluish-gray zone, shading off from cartilage to ossified shaft. The zone of imperfect, atypical ossification was two millimetres in width.

The points of especial interest in the case were: 1. The extensive pachymeningitis. 2. The imperfect, atypical intracartilaginous ossification. 3. The case was an excellent example, taken all together, of rachitis in a child of twenty-three months. Pachymeningitis is not given by the authors as a usual complication of rickets, and seems in this case to have been rather a natural accompaniment of the depraved general blood condition.

#### CHYLOUS ASCITES.

DR. H. M. BIGGS showed some fluid from a case of chylous ascites. The patient was addicted to alcohol, and gave a history of gradually developing cirrhosis of the liver. The fluid removed at the first tapping was perfectly clear but the fluid that oozed through the trocar opening was white like that presented to the Society. No fat could be seen on examination of the fluid under the microscope, although chemical examination shows the presence of fat in fluid of this kind.

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*Stated Meeting, March 26th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

#### ETIOLOGY OF CANCER OF THE CERVIX UTERI.

DR. C. N. DOWD presented a specimen taken from a cauliflower-like growth on the cervix uteri of a patient, twenty-two years of age, who had given birth to a child two years before. The cervix was much enlarged and lacerated bilaterally. The cauliflower-like excrescences were abundant, and many of them were so brittle that they could be pulled off by the forceps. The surface bled freely on irritation. In making a diagnosis the following points were to be considered: The appearance of the growth was that of a carcinoma, but it had not involved the vaginal walls; there was none of that peculiarly offensive sanious discharge which is so characteristic of cancer of the uterus; the patient was but twenty-two years of age, and did not present a cancerous cachexia. Hence the probabilities were decidedly against cancer, yet the possibility of a malignant new growth not far advanced, which had started in granulation tissue, was to be considered, and microscopical examina-



tion was necessary to decide the question. This was made on a section cut from the granulating surface, and on one of the excrescences which was pulled away. At the edge of the section there were round and elongated cells, packed closely together, which in spots looked very much like sarcomatous tissue. There were also a few polynuclear cells resembling giant cells. There were ill-defined blood vessels and a moderate amount of connective tissue; at a distance from the surface this connective tissue was more abundant. One could not assert positively from the microscopical examination whether this was granular tissue taking on the type of sarcoma, or not.

The relation between granulating lacerated cervix and malignant growth is one of very great importance from a practical standpoint. On the one hand unnecessary operations are performed, and on the other cases of cancer are allowed to develop until no operation can be of any use. The consensus of opinion certainly is that there is a predisposition to malignant growth in a lacerated and granulating cervix.

Martin, Skene, Emmet, Hart and Barbour indicate this opinion.

Gusserow found that the average number of children which women with carcinoma of the uterus had borne was five.

The following statistics, taken from the last United States Census Report, show something about the frequency of the disease and the relation between malignant growth and parturition in this country:

During the census year 13,068 deaths from cancer were reported. Of these 4,875 were of men, 8,193 were of women. About 2.4 per cent of all deaths from known cause in women were from cancer.

The location of these cancers was as follows: Uterus, 33 per cent; breast, 23 per cent; stomach, 20 per cent; liver, 5 per cent; head, face, and neck, 5 per cent; abdomen, 4 per cent; mouth, tongue, and throat, 3 per cent; rectum, 2 per cent; lower extremities, ovaries, eyes, lungs, genitals, upper extremities, bladder, 5 per cent.

In the same report the distribution in age in one thousand cases of cancer of the uterus in married, and one thousand cases in unmarried, women is given.

I will quote the distribution between thirty and seventy years of age:

AGE.	SINGLE.	MARRIED.
30-35 years.....	45	45
35-40 " .....	77	88
40-45 " .....	91	119
45-50 " .....	108	157
50-55 " .....	94	157
55-60 " .....	101	123
60-65 " .....	85	106
65-70 " .....	82	77



This shows an excess of about fifty per cent in married women between the ages of forty-five and fifty-five, and an excess of about twenty-three per cent between the ages of thirty-five and forty-five, and between the ages of fifty-five and sixty-five.

There was a predominance in unmarried women under thirty-five and over sixty-five years of age.

It is impossible to state whether these were due to lacerations of the cervix, or to endometritis, or to the changes which the uterus passes through during and after pregnancy; but there certainly is a marked tendency to malignant growth at the time when the lacerations of the cervix would be expected to have the greatest effect. Hence we find that the gross appearance, the microscopic appearance, and the clinical and pathological records all tend to show that lacerated granulating cervixes predispose to the development of malignant growth, although none of them prove definitely that they cause it.

DR. H. J. BOLDT thought that the specimen under the microscope closely resembled carcinoma; and the clinical history, which was often of still greater importance in these cases, tended to confirm the indications of malignant disease.

#### CANCER OF THE LIVER.

DR. HODENPYL presented a specimen of cancer of the liver removed from a woman, about fifty years of age, who had entered St. Francis' Hospital suffering from an abdominal tumor on the right side. An exploratory incision was made, but further operation was inadmissible. The autopsy showed a large cancerous growth in the lower portion of the right lobe of the liver. The gall bladder was filled with calculi, and the fundus appeared normal in thickness; but the other extremity was completely ulcerated away. The intestines, stomach, and peritoneum were firmly adherent to the under surface of the right lobe of the liver, and the large intestine opened directly into the large cavity seen in the specimen.

#### PRIMARY CANCER OF THE UTERUS.

DR. J. H. LINSLEY presented a report of a case of carcinoma, and exhibited under the microscope sections of the growth. The specimens were removed from the body of a married woman, forty-five years of age, who had had one child after an easy labor, and several miscarriages, always between the second and fourth months; but these never affected her health, which was always excellent. About two months ago she noticed the abdomen was growing larger, and she had occasional pain. At the same time she began to lose appetite and strength. Latterly she had had swelling of the left leg and considerable dyspnoea. She was admitted to St. Luke's Hospital, where laparotomy was performed by Dr. Abbe. The

operation was performed under chloroform, as the woman was too weak to take ether. An incision was made in the median line down to the peritoneum. This was picked up with forceps and nicked, and, Chamberlain's tube being introduced, three-fourths of a large bucketful of yellow, glairy, albuminous fluid was withdrawn, much being left in the abdomen. Examination by the finger showed cysts of various sizes scattered here and there, and a papillomatous growth was felt in the anterior abdominal wall, involving part of the bladder. The peritoneum was covered with small tubercles, one of which was cut off for examination. The wound was then closed and an antiseptic dressing applied. The patient complained of no pain until toward the end of the operation. After this operation the condition remained about the same, the patient gradually grew weaker, and died three months later.

*Autopsy.*—The peritoneum was thickened and roughened everywhere, and adhesions were very numerous. There was one large mass, consisting of omentum and folds of intestine, adherent to the peritoneum directly beneath the umbilicus. The intestines were bound down everywhere by firm adhesions, and on their surface were many small, hard, whitish nodules. The right lobe of the liver was deeply scarred, its capsule was thickened, and on its surface were several hard nodules about the size of a pea. The pancreas appeared to be studded with whitish nodules or deposits of new formation. All the pelvic organs were so bound down that they were hardly distinguishable. The surface of the peritoneum was covered everywhere with new formation of the same appearance as that already noted. The mucous membrane of the rectum was normal in appearance, except at one point over the brim of the pelvis, where there was an ulcer two-fifths of an inch in diameter. In the floor of the bladder there were numerous deposits of new formation, and the wall of the vagina was also infiltrated, in places, with the same growths. The outline of the body of the uterus was not distinguishable, but on following its cavity it was found to be bound down to the rectum, being sharply retroflexed, and infiltrated with the new formation. Numerous cysts were found on either side of the body of the uterus, the larger of which were one and a quarter inches in diameter, and corresponded to the location of the Fallopian tubes. The ovaries could not be distinguished.

Examination of the new growth under the microscope showed it to be carcinoma. It was characterized by an abundant stroma of connective tissue with alveoli of various sizes, some of which were quite large and were filled with epithelium. The epithelium was small, flat, and cuboidal in shape, and distinctly nucleated. The growths examined in different parts of the organs where this new formation was seen exhibited the same structure. In various organs the walls of the blood vessels were seen to be thickened. The seat of the primary growth was undoubtedly the uterus.

## METASTATIC CARCINOMA OF THE STOMACH.

DR. JOHN S. ELY presented some specimens illustrating carcinoma of the right testicle, with metastases in the lungs, stomach, and falx cerebri. The patient was a man, thirty-nine years of age, who had entered St. Luke's Hospital on account of a painful tumor in the right testicle. He had been ruptured for about twenty years, and had worn a truss all that time, and the previous winter had procured a new one, which had fitted poorly and had caused a good deal of irritation and discomfort. About three months before admission to the hospital he had noticed that the testicle was enlarged, rather hard, and tender, and a little later he discovered a hard mass extending upward and outward from the testicle, to which it seemed to be attached. The sac of the hernia was above this mass and was reducible. The testicle was removed, and was found, on microscopical examination, to be cancerous. Two months after leaving the hospital the patient began to have pain in the right inguinal region, and soon a tender tumor was discovered in this place. On examination the tumor was found to extend upward as far as the level of the anterior superior spinous process of the ilium, and inward to the external border of the rectus abdominis muscle. Laparotomy was performed by Dr. B. F. Curtis, but a mass of such considerable size was found lying against the lumbar vertebræ that it was deemed inadvisable to attempt the removal of any of it. About a month later the patient died. At the autopsy numerous nodules were found scattered throughout the lungs, varying in size up to one and one-half inches in diameter, most of them white with reddish spots, and circumscribed, though in the lower portion of the left lung there was much diffuse infiltration of white tissue. The bronchial glands contained some cheesy nodules. In the cardiac portion of the stomach, near the greater curvature, was a mass resembling the other tumors, which was apparently in the submucous coat. This was found on section to consist of two small nodules. There was a mass of nodular growths along the psoas muscle and vertebral column from Poupart's ligament to the diaphragm. There were also a few isolated nodules along the dorsal vertebræ. The mass in the pelvis enveloped the large vessels to a great extent, and in the lower portion of the inferior vena cava and in the right common iliac vein there were firm clots, somewhat adherent in spots, soft and gray. A few small nodular growths, some of which appeared to be ulcerated, projected into the lumen of the vena cava. In the falx cerebri, about one and one-half inches from the anterior end, was a tumor one inch in diameter, irregularly nodular and of encephaloid consistence, reddish exteriorly, but gray in the centre. Microscopical examination of all these neoplasms showed them to be the same in

structure, the tumors being recognized as medullary or encephaloid carcinomata.

Irritation caused by the truss or by the non-descent of the testicle may have had something to do with the development of the cancer, which spread along the pelvic and lumbar lymphatics. Metastases in the stomach were very rare; he had only been able to find twenty-four such cases mentioned. The case was a striking verification of the statement made years ago by Virchow, that malignant tumors occurred least frequently, metastatically, in those organs in which they are most common as primary growths. Metastases of the dura mater and falx cerebri are quite unusual, only twenty-five cases of metastasis of the whole dura mater being found in a series of three hundred and sixty-six cases of primary carcinoma of the mamma. An examination of the lungs showed numerous arteries filled with clots, many of which contained large numbers of epithelial cells similar in every respect to the epithelial cells found in the tumors throughout the body; and similar to the epithelial cells which were visible in the specimen showing a nodule in the inferior vena cava. This nodule showed a rupture of its walls on the upper side, and over this was a small clot.

DR. DOWD said, regarding the question of irritation as a factor in the production of cancer, that it was interesting to recall the statistics of Siegler, which showed that out of a large number of collected cases, from seven to fourteen per cent could be traced to irritation. Wolff also gave the statistics of a series of cases of carcinoma occurring in one of the Berlin clinics during a period of eleven years. Out of about six hundred cases, fourteen per cent gave a history of traumatism.

DR. B. F. CURTIS thought there could be no question about the greater liability of the undescended testis to malignant disease; and when the testis was situated near the ring, this was particularly noticeable. But in this connection it was curious to note how rarely malignant growths were found in connection with epididymitis, hydrocele, and other inflammatory conditions, in which the testicle was exposed to violence.

#### CANCER OF THE BREAST.

DR. CURTIS presented a series of large sections of carcinoma of the breast, made through the entire gland by means of special microtome used for cutting similar sections of the brain. The specimens had shrunk about one-third in the hardening process. The sections had been stained with various agents, such as carmine-hæmatoxylin, and safranin. The first section showed the growth occurring in a very stout woman, in whom there was a layer of fat about one inch thick between the gland and the skin. The second section showed the growth in the centre of the gland, spreading



through the nipple into the skin. As was usual in cases involving the skin, the recurrence in this patient was very rapid. The third specimen was from a woman of about forty-five years of age, who had never had any children, and in whom the gland was quite small. The degeneration had spread through the gland and into the nipple, but the mass was entirely distinct from the nipple. The patient died from early metastasis in the liver. The fourth specimen showed the involvement of the nipple; and the fifth slide showed a specimen of cystic carcinoma.

#### PRIMARY CANCER OF GALL BLADDER.

DR. FRANK FERGUSON presented specimens removed from a woman, sixty-seven years of age, who was admitted to the New York Hospital in a moribund condition. At the autopsy the entire gastro-intestinal tract was found to be free from cancerous growths. The side of the gall bladder next to the liver was thoroughly infiltrated with cancer, the thickest part of the growth in its walls being elevated one-fourth of an inch above the mucous membrane. From the neck of the gall bladder to the common duct the duct was normal. The gall bladder contained two calculi of moderate size, triangular in shape, and having fairly sharp angles. The liver extended in the median line to the umbilicus, and on the right side to the crest of the ilium. Its surface was nodular, and the organ itself contained large cancerous masses, such as were usually regarded as secondary to cancer in the gall bladder. Dr. Ferguson considered that the cancer of the gall bladder was primary, for the following reasons: 1. A number of cases of primary cancer of the gall bladder had been reported. 2. Primary cancer of the liver was extremely rare—he had not met with a single case in his own experience. 3. In cases which had been conceded to be primary, the growth had occurred as one or two large masses confined to one portion of the liver. 4. The growth in the present case was continuous with the mucous membrane of the gall bladder. 5. In accordance with the law already alluded to, viz.: that those organs which were commonly the seat of primary cancer were very rarely the seat of secondary generalization.

The case was also of interest as presenting the somewhat rare condition of intestinal diverticula. These diverticula were of various sizes, extending from the mucous membrane through the muscular wall of the large intestine, and containing masses of hardened feces. There was a cavity in the retroperitoneal tissue which established communication between the gut and the peritoneal cavity, and gave rise to a general peritonitis. Some time ago a similar case had been presented by Dr. Hodenpyl.

DR. H. M. BIGGS said that, about two years before, Dr. Ferguson had presented a specimen of this sort, and had commented on the



rarity of its occurrence in his own experience. The speaker had given the matter careful attention since that time, and had observed four cases—one in which there was perforation, and three in which this condition did not exist.

DR. FERGUSON replied that he always examined the large intestine carefully, but had only been able to find six examples of the condition in question. Even quite recently the literature showed only a very few recorded cases.

#### HÆMORRHAGE FROM THE SUPRARENAL CAPSULE IN VERY YOUNG CHILDREN.

DR. HODENPYL said that Dr. Prudden had recently presented a case of hæmorrhage from the suprarenal capsule in a very young child; and he desired to add another case showing some peculiar features.

The child from which his specimens were taken was born after a perfectly normal labor, and appeared to be doing well up to a few hours before death, which occurred on the third day, after sudden symptoms of collapse. The autopsy showed the abdominal cavity distended with blood, which had come from a rupture of the right suprarenal body. The remarkable feature of the case was that the suprarenal body had penetrated the under surface of the liver, and stripped up Glisson's capsule for a considerable distance. There was also an infarction of the lung.

DR. HODENPYL also presented a case of

#### ABSCESS OF THE SPLEEN.

The specimen was removed from a man about forty years of age, who died with symptoms of chronic Bright's disease. The kidneys showed the changes of the advanced stages of this disease. The spleen was quite large, and surrounded by a mass of thickened fibrous tissue and adhesions, in which was a sacculated abscess. In the lower part of the organ the spleen pulp had broken down, forming a cavity which was filled with fetid pus. There was no evidence of infarction, the brain, lungs, and heart were normal, and the speaker was at a loss to account for the condition.

#### PACHYMENINGITIS INTERNA HÆMORRHAGICA.

DR. WILLIAM P. NORTHRUP reported three cases of this affection as supplementary to the case presented by him at the last meeting of the Society. They were taken from the records of the Foundling Asylum. The first case was that of a girl four years and seven months old. The child was returned to the asylum in midsummer in miserable condition, with a diagnosis of tuberculosis. It improved later, then had whooping cough, and suffered from diarrhœa characterized by a very offensive odor, and after this failed,

and finally died after three days of repeated convulsions. On autopsy its body was seen to be extremely emaciated. The brain was normal, pia mater oedematous. The dura mater lining the left half of the calvarium was covered with an exudate as thick as blotting paper, opaque, mottled-red, dark and pale. The right half was covered with a thin pellicle which could easily be scraped from the dura mater, and when placed under the microscope was found to contain an abundance of newly formed blood vessels with thin walls. The lungs were adherent, oedematous, and the seat of chronic broncho-pneumonia. There were no tubercles in any part of the body.

The second case was that of a male child, four months and nineteen days old, whose chief symptom was drowsiness. It "looked sick," but physical examination gave a negative result, and no diagnosis was made. It died after a prolonged series of convulsions. At the autopsy the anterior fontanelle was seen to be widely open, and the frontal suture was also open down as far as the nasal eminence. There were no signs of inflammation nor of external injury. The dura mater investing the inner surface of the posterior half of the skull from the base to the apex, was covered with a pellicle which could be easily scraped from the surface, and which showed under the microscope newly formed vessels with thin walls, dotted everywhere with points of hæmorrhage. No other lesions of moment were found in the case. There were no tubercles and no evidences of meningitis.

The third case was that of a male child, nine months and nineteen days old. The child was returned to the house in a wretched condition, and died after repeated convulsions. At the autopsy it was seen to be markedly rachitic. There was a well-marked exudate upon the entire surface of the brain from the vertex to the base; the ventricles were dilated; the medulla was normal. The dura mater in the middle fossa and inner surface of the temporal region was covered with a rine pellicle containing newly formed vessels and punctate hæmorrhages. This pellicle was easily stripped from the inner surface. There were no other lesions.

In addition to these four cases the records of this Society, Dr. Northrup said, furnish at least two more; one a child twenty months old, having meningitis and pachymeningitis, presented by Dr. L. Emmett Holt in 1887; the other a child of eighteen months, presented by Dr. S. J. McNutt within the past year. Pachymeningitis is "characterized by the formation of layers of delicate connective tissue with numerous very thin-walled blood vessels from which the blood is prone to escape" (Delafield and Prudden). As there had been some doubts expressed as to the correctness of the diagnosis in the case presented by him at the last meeting, he desired to have the specimen referred to the Committee on Microscopy. He had

met with only four cases, all under two years of age, in an experience founded upon fifteen hundred autopsies.

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*Stated Meeting, April 9th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

REPORT OF THE COMMITTEE ON MICROSCOPY.

DR. JOHN S. ELY, from the Committee on Microscopy, reported that the specimens submitted by Dr. Northrup, at the last meeting of the Society, presented the appearances of pachymeningitis interna hæmorrhagica.

SMALL AND LARGE ROUND AND SPINDLE-CELL SARCOMA.

DR. JOSEPH H. LINSLEY presented a specimen removed from the body of a man, aged fifty-three, giving the following history: The patient was a German, who was admitted to the Post-Graduate Hospital under the care of Dr. Kammerer. The tumor was first noticed about thirteen years ago, but it remained quite small (the size of a teacup) until about four weeks before admission, at which time it began to grow very rapidly. For the past two weeks it had caused distressing dyspnoea, increased by exertion and becoming rapidly more serious every day. The patient became emaciated, had dysphagia and distressing periods of coughing. From the location of the tumor it was undoubtedly of the thyroid gland; it measured perpendicularly five inches, extending from two inches above the sternum to three inches below the mental process; the transverse measurement carried over the cricoid was six inches; the skin was raised from its normal level about two and one-half inches over the centre of the tumor. The shape was symmetrically round, except that from the right upper portion a lobe extended upward to near the angle of the jaw, while on the left side there were two inches between the border of the tumor and the corresponding angle. The skin covering the tumor had a normal appearance. The tumor was hard and somewhat nodular, not painful nor tender on pressure. Several introductions of the exploring needle gave no evidence of its being cystic. While the tissues were not flabby, there was still a tendency to sag. The patient was put under chloroform and died during the operation, on the table. The tumor extended to the vertebral column and was very firmly bound down by adhesions; it weighed six hundred and fifty grammes. The heart weighed four hundred and thirty grammes. The edges of the aortic valves were much thickened, and their surfaces somewhat roughened. The muscular tissue of the heart was of a brown color. The upper lobe of the left lung was poorly aerated. On

the surface, and scattered through the organ, were hard, white nodules, varying in size from that of a small pea to that of an English walnut. The lower lobe was poorly aërated and slightly oedematous. The apex of the right lung was completely infiltrated with these nodules, one of which measured about four centimetres in diameter and was broken down in its centre. The middle lobe of this lung was deeply congested and oedematous. Projecting from the anterior surface of the lung was a fairly firm white mass, three centimetres in diameter. There were also many hard, white nodules scattered throughout the lobe. The lower lobe was congested and oedematous, and contained a number of these nodules. On the surface of the left kidney were seen two hard nodules about one centimetre in diameter. In both kidneys the capsule was adherent, the surface was granular, and the markings fairly distinct. The mucous membrane of the stomach in general looked normal. Near the pyloric end was a hard, white spheroidal nodule, one centimetre in diameter, the centre of which was depressed. In the lower part of the jejunum the gut was invaginated, though there was no obstruction. The mucous membrane of the colon was deeply congested. The lower part of the alimentary tract contained a large quantity of tarry material. At different places throughout the small intestine were found nodules and ulcers, varying in size from a pea to a silver dollar. The edges of these ulcers were somewhat raised above the surface of the mucous membrane, and their surface was nearly black. There seemed to be some increase in the connective tissue of the liver and a deposit of fat. On the anterior surface of the right lobe was found a small white nodule, one-half centimetre in diameter. The gall bladder was normal and contained a small quantity of natural-looking bile. The bladder contained a small amount of urine, and its wall was greatly hypertrophied.

*Microscopical Examination.*—The tumor was composed almost exclusively of small round, large round, and spindle-formed cells. There was a fibrous stroma, but it was not prominent, and the relation between it and the cells was most intimate. The vascular supply was abundant, and the walls of the vessels thin. A considerable amount of granular matter, which stained poorly, was seen. The growth was a sarcoma. The alveolar walls of the lungs were thickened and somewhat infiltrated with small round cells. A large area was seen where the structure of the lung was lost, its place being occupied by small and large, round and spindle-formed cells. Numbers of these cells were also seen in many of the air spaces of the lungs. In the kidneys a large area was seen extending from the cortical into the medullary portion of the organs, the structure of which was similar to that of the tumor. Very little of the normal structure of the spleen was seen in the sections exam-

ined. The greater number of the sections showed the presence in large numbers of sarcomatous cells. The interstitial connective tissue of the liver was increased, and areas composed of the same variety of cells before described were seen. Sections taken from the ulcers or nodules in the intestines showed the same sarcomatous structure. The villi were infiltrated with these cells, and a large growth of them was seen in the submucosa widely separating the muscularis mucosæ and the muscular coats. The blood vessels were distended with blood, and the columnar epithelium covering the villi, in the neighborhood of the growths or nodules, were either very granular or wholly lost.

#### AN ANENCEPHALOUS MONSTER.

DR. JOHN S. ELY presented an anencephalous monster from the museum of the College of Physicians and Surgeons. The specimen also showed a certain amount of opening in the spinal column. There was absolutely no indication of any brain, all that was to be seen being some membranes with a little fluid beneath them. The speaker had seen four similar specimens within about four years.

#### CHRONIC ENDARTERITIS.

DR. ELY also showed some specimens removed from the body of a woman about fifty years of age. She had had the typical symptoms of chronic Bright's disease with contracted kidneys. At the autopsy the kidneys were found to be extremely small and contained cysts, in some of which were to be seen arteries running through their walls. In the heart light spots were seen, suggesting interstitial myocarditis. The lungs contained some brown induration. The liver was fatty and congested. There was chronic endarteritis generally distributed throughout the body. The point of special interest in connection with the specimen was to determine whether the kidney trouble or the endarteritis were the primary lesion.

#### PACHYMEINGITIS INTERNA HÆMORRHAGICA.

DR. WILLIAM P. NORTHRUP presented another specimen, supplementary to those submitted at the two previous meetings, showing the lesions of pachymeningitis interna hæmorrhagica. The specimens were taken from the body of a child about one year old, who was sick about one month. When it first came under observation it had diarrhœa, a temperature of 104° F., was restless and somewhat rigid. Apart from this it had no special cerebral symptoms. The diarrhœa improved, but the child continued fretful and had a moderate cough. There were at no time convulsions, paralyses, eye symptoms, nor tâche cérébrale. The child subsequently developed acute enteritis with a final temperature of 107° F., and died.



*Autopsy.*—The body was moderately well nourished; there was a slight rachitic rosary. There was moderate internal pachymeningitis with slight hæmorrhage. One patch, more marked than any other, was situated at the left apex of the calvarium. A film made up of fine vessels could be easily scraped away. Aside from the patch, at the left apex was a diffusely distributed delicate pelli-cle with fine vessels, the course of the latter being marked with punctate hæmorrhages. The pia was cedematous and "wet," but was itself normal. The heart was normal. The bronchial lymph nodes were enlarged, red, not tuberculous. Moderate congestion and consolidation of the posterior margin of both lungs, with scattered lobules of pneumonia and bronchitis. The mesenteric nodes were large and red, Peyer's patches were swollen and red, and there was an increase of mucus. Among the long bones examined, the lower end of the femur showed an irregular line of ossification.

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*Stated Meeting, April 23d, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

PACHYMENINGITIS INTERNA HÆMORRHAGICA.

DR. WILLIAM P. NORTHRUP presented a card specimen showing the early stage of pachymeningitis interna hæmorrhagica. The specimen was from a child, two months of age, the subject of congenital syphilis.

PACHYMENINGITIS HÆMORRHAGICA.

DR. E. D. FISHER presented a specimen showing this lesion. The patient had presented no especial symptoms during life, except a mental dulness, and no diagnosis had been made. At the autopsy there was found to be an old pachymeningitis with recent hæmorrhage.

ANEURISM OF THE AORTA.

The patient from whom this specimen was removed was a man, fifty-five years of age, born in Switzerland, who was also a sufferer from goître. He had been in bed all the time, and presented no symptoms whatever pointing to aneurism. At the autopsy there was found an aneurism involving the ascending aorta and the arch. The heart was also somewhat dilated. The question that had occurred to the speaker was whether there was any connection between the aneurism and the goître. There had been no dyspnœa noticed, for the man was always in bed, and there had, in fact, been no symptoms at all except marked stupidity.

## DIAPHRAGMATIC HERNIA.

A third specimen was one removed from the body of a woman at autopsy. The woman had had a strangulated inguinal hernia, and had vomited a great deal, and was much exhausted. The strangulation was relieved, but she died suddenly soon after. At the autopsy there was found a small opening in the diaphragm through which about half of the stomach had passed.

## EXTENSIVE DESTRUCTION OF BRAIN TISSUE.

The fourth specimen was one removed from an old case of hemiplegia. The dura was found adherent to the convex surface, especially along the longitudinal fissure. There was atrophy and sinking-in of the convolutions, and on cutting into them the left lobe was found almost completely disorganized. The speaker thought that this was due to the hæmorrhage, the only question being whether there had been also an abscess of the brain.

## CHRONIC ENDOCARDITIS WITH VEGETATIONS.

DR. H. P. LOOMIS presented specimens showing chronic endocarditis with vegetations and secondary sepsis, simulating acute ulcerative endocarditis. The patient, John M—, was brought into Bellevue Hospital in a semi-conscious state, and nothing concerning his previous history could be learned. When seen by the house physician the patient was sitting up in bed suffering from intense dyspnœa. There was general dropsy, and cyanosis was marked. It was impossible to diagnose the cardiac lesion by the murmurs. Temperature was 104° F. ; the pulse was 140, feeble and irregular. Petechial spots were visible over the entire body, more especially on the lower extremities. Ten hours after admission the patient died.

*Autopsy.*—The pericardium was normal. The heart was hypertrophied and weighed sixteen ounces. There was dilatation of the left ventricle, the thickness of its wall being only eight millimetres. All the aortic cusps were thickly coated with vegetations of a grayish-yellow color, presenting a fungous appearance, and extending from the attached border of the valves for a distance of two centimetres. The edges of the erosions were uneven, granular, and somewhat hidden beneath the fungating growths surrounding them. The vegetations were firmly attached to the surface of the endocardium, and on microscopical examination were found to be made up of fibrin and granular débris with some cellular elements. At the base of the vegetations was thickened and inflamed endocardial tissue, in which, on staining with fuchsin, were found micrococci. There was stenosis of the mitral valve, but no vegetations or ulcerations were found around the

valvular orifice. Both lungs were normal, with the exception of a gangrenous cavity in the upper portion of the lower lobe of the right lung, close to the root of the lung, six centimetres in length and three centimetres in width. The edges of the abscess were irregular, but limited by newly formed connective tissue plainly visible to the naked eye, and its cavity contained broken-down pulmonary tissue and cheesy pus. A large vessel leading to the abscess cavity was obstructed by a white thrombus two centimetres in length. All the bronchial nodes at the root of the lung were greatly enlarged, three of them reaching an enormous size, one being five and one-half centimetres in length and three centimetres in thickness. Without question the abscess cavity was a gangrenous infarction, and its close proximity to the bronchial nodes at the root of the lung led to their septic condition. The spleen was about two and a half times its normal size, and contained two large white infarctions four centimetres in diameter, together with fifteen or twenty small ones scarcely visible to the naked eye. The kidneys presented the lesions of a moderate amount of chronic diffuse nephritis. Numerous small infarctions were scattered throughout the cortex of both kidneys. The liver was normal. The mucous membrane of the intestines was very anæmic, but presented no pathological lesions. The brain was not examined.

*Remarks.*—A cursory examination of this case, Dr. Loomis said, would lead one to pronounce it acute ulcerative endocarditis. The high temperature, the petechial spots, the almost typical appearance of the aortic valves, the presence of micrococci, and the multiple infarctions in the various organs, all seemed to bear out this diagnosis. Upon careful analysis, however, the pathological changes were found to be more satisfactorily explained by considering that the micrococci found in the diseased valves were the result of a secondary infection, and not the primary cause of the condition. The speaker presented this case because he thought it represented a type of a large number of cases which are called by many acute ulcerative endocarditis, the chief cause of such a diagnosis being that micrococci are found in the vegetations on the valves. The specimens here presented were from the body of a man who had an old lesion of the aortic valves, as proven by the cardiac hypertrophy and dilatation. Dr. Loomis offered an explanation of the other lesions as follows: From some unknown cause, possibly from a lowered condition of the system, the quality of the blood became changed and fibrinous masses were deposited on the thickened and eroded aortic valves. These afterward broke off and passed to different organs (for white infarctions were found in the spleen and kidneys). In time one of these masses reached the lungs and plugged so large a vessel that necrosis of the pulmonary tissue took place. An abscess formed, and communicated most

probably with a bronchus. Bacteria were present, together with the staphylococcus pyogenes aureus. These readily gained entrance to the blood current, either directly or by the lymphatics, for the enormously enlarged bronchial glands showed that they were infected. The micrococci in the blood found in the already diseased valves a fit soil for their growth, so the vegetations became—not primarily, but secondarily—infected. The speaker had had, during the past year, the opportunity to make a number of autopsies on cases of so-called acute ulcerative endocarditis. Most of these cases, when studied from a pathological standpoint, were similar to the one just presented, and were not true types of acute ulcerative endocarditis, as that term is now understood.

DR. ELY said that Dr. Loomis' conclusions agreed with those of several investigators in Germany and elsewhere. Dr. Prudden had also found in the course of some laboratory experiments that it was necessary to injure the valves, otherwise the bacteria would not lodge on them.

#### INTERSTITIAL PLACENTITIS.

DR. CHARLES N. DOWD presented some microscope slides of a placenta coming away in a case of miscarriage. In the case of a mole which he had presented some time ago there was also interstitial placentitis. The specimens were interesting as suggesting that interstitial placentitis might be more common than was generally supposed, and might perhaps be a somewhat frequent cause of miscarriage. The woman in this instance was perfectly healthy and gave no symptoms of syphilis.

#### VARIATIONS IN THE MODE OF GROWTH OF TUBERCLE BACILLI.

DR. E. L. TRUDEAU presented by invitation some specimens and made the following remarks: "These tubes, marked No. 1 and No. 2, contain pure cultures of the tubercle bacillus on glycerin-agar, and are of interest as illustrating some possible variations in the growth of the microbe. No. 1 was obtained by myself at the laboratory of the College of Physicians, through the courtesy of Dr. Prudden, from the lung of a man who died of acute miliary tuberculosis, and is only the third generation direct from the human lung. No. 2 was brought by Dr. Currier from Europe, and is supposed to have originated from artificial tuberculosis in a guinea-pig, but the data on this point are somewhat uncertain; it has been under artificial cultivation for a long time. The differences in the growths are marked. No. 1 culture consists of dry scales growing very slowly in irregularly heaped and somewhat rounded masses, which can be raised entire on a needle from the subjacent agar without leaving a trace of their presence, these being all the usual characteristics of a pure culture of the tubercle bacillus. No. 2



shows small, white, creamy growths which take place much more rapidly than is the case with No. 1, the surface remaining tolerably even until the end of the fourth week of its stay on the thermostat, when it begins to crumple up and present very soon high ridge-like plaits, more especially toward the centre; these cultures are neither dry nor scaly, but are of the consistence of thick cream and adhere pretty closely to the subjacent culture medium. No. 1 grows abundantly on potato; No. 2 but very slightly, if at all. The lesions resulting from the inoculation of both types of growth in animals vary perceptibly, those produced by No. 1 becoming more rapidly generalized, and caseation occurring at an earlier date than when No. 2 is injected. The variations referred to appear to be quite constant, for they are still to be found after the microbes have been passed through a living animal, the plants made from the resulting lesions showing each type to have retained its own peculiarities.

"Up to the present time no variations in the mode of growth of the tubercle bacillus have been recorded. Whether the deviation shown by No. 2 culture and the apparent diminution in its virulence are due to long cultivation and to its attendant artificial conditions of existence, is difficult to determine, though similar deviations from the normal have already been noted under similar conditions in several other pathogenic bacteria, and notably in Löffler's diphtheria bacillus. One passage through a living animal does not, however, efface the peculiarities. The morphological appearance of both these microbes under the microscope, the tenacity with which both retain the aniline dyes in the presence of nitric acid, and the approximate similarity of their pathogenic properties (inoculations made with either resulting in nodules identical with those found in tuberculosis) would seem to preclude the possibility of No. 2 being anything but a variation of the tubercle bacillus, especially when we remember that other bacteria (of which anthrax is perhaps the best example) have a wide range of deviation from the normal, not only as to their mode of growth, but as to their morphological appearance and pathogenic properties as well. Indeed, it is upon these variations that the principle of successful vaccination in anthrax rests, and this lends an additional interest to the departure from the normal type which these cultures demonstrate.

"I also show you here several flasks containing a pure culture of the tubercle bacillus in a liquid medium. As far as I know, the culture of the tubercle bacillus in liquids has never been described, at least not in this country. The growth always takes place at the bottom of the vessel, if the liquid is at rest, in a mucus-like film, much resembling vesical mucus in urine. After a stay of six weeks in the thermostat this film has become a dense yellowish mass of the same consistence and appearance as bronchial mucus; indeed, you will notice that, curiously enough, these cultures resemble



nothing so much as a large lump of phthisical sputum lying on the bottom of the jar. Under the microscope the appearance of the bacilli does not differ materially from that of those grown on solid media."

#### LUNGS IN ARTIFICIAL TUBERCULOSIS.

DR. TRUDEAU then showed two sets of lungs taken from rabbits inoculated in the rim of the ear with a pure culture of the tubercle bacillus, and killed two and three and a half months respectively after the inoculation. They both presented the same lesions, but at different stages, the lesions being almost identical with those of acute military tuberculosis. They were both literally riddled with tubercular nodules, and large caseating foci were pretty evenly distributed on the pleural surface. These large caseous masses may have been produced at the spots where small lumps of culture have become lodged. The cultures made use of for these inoculations had been grown on potatoes.

The speaker then presented a third set of lungs, with a drawing which illustrated most strikingly Nature's conservative efforts as displayed in artificial tuberculosis. "These organs were removed from a rabbit ten weeks after inoculation of a pure culture of the tubercle bacillus directly into the right pleura and lung. The animal was kept out of doors and under excellent hygienic conditions. No microscopical tubercles are seen in this case to stud the lung and pleura, but several large, fibrous-looking tumors, adherent to the visceral pleura, are visible at the point of injection and at various other places on the surface of the lung and pericardium. These gigantic nodules are seen to consist, on section, of a thick fibrous capsule containing a mass of caseous material swarming with bacilli. The drawing was taken by Dr. Prudden, from the microscopical appearance presented on section of a similar nodule to those attached to the lung under discussion, and shows the encapsulated bacilli in the centre of a very thick fibrous capsule which ends in a narrow pedicle attached to the pleural surface. The bacilli swarm in the centre, diminish in numbers as the capsule is approached, and not a single one is to be seen in the fibrous tissue of which the latter is composed. What would have been the subsequent fate of these microbes thus imprisoned can only be a matter of conjecture, but it does not seem unlikely that either they would ultimately have been obliterated by the steady contraction of the fibrous tissue surrounding them, or that they might have escaped from their mechanical limitations by ulceration, and thus endangered the integrity of the surrounding tissues and the life of the animal. No doubt secondary tuberculosis and relapses in chronic phthisis have frequently a mechanism very similar to that which these nodules illustrate. I have succeeded in obtaining pure cultures of the bacil-

lus, a year after inoculation, from similar nodules taken from the same animal who furnished the specimen for this drawing, and who was apparently in good health and presented otherwise sound organs when killed."

DR. PRUDDEN asked how early Dr. Trudeau had observed caseation to occur in artificial tuberculosis.

DR. TRUDEAU answered that he had seen it at the end of from the fifth to the eighth week, but if large masses of bacilli were injected it might appear much earlier at the site of injection, but not in distant lesions.

#### CHRONIC ALCOHOLISM IN A BOY OF THIRTEEN YEARS.

DR. H. M. BIGGS presented a specimen of advanced cirrhosis of the liver, taken from the body of a boy, thirteen years of age, in whom were found all the other lesions of chronic alcoholism. When the child was two years old he had an attack of bronchitis, for which the physician prescribed whiskey. He seemed to be fond of it, and his parents allowed him to gratify his taste whenever he desired, giving him money for the purpose. He used to drink about an ounce and a half six or eight times a day. The day of his death he purchased a larger quantity than usual, and drank it all at once. He was found some hours after in a semicomatose condition, from which he never rallied. At the autopsy the liver was found to be markedly cirrhotic, and all the other lesions of chronic alcoholism were present in advanced degree.

#### PERFORATION OF THE TRACHEA.

A second specimen presented was one removed from a patient who had died in Charity Hospital. He was admitted suffering apparently from anæmia with some bronchitis. He gradually failed and finally developed a dyspnœa which was continuous but marked by paroxysmal exacerbations. There were râles to be heard in both lungs. The patient died in one of these paroxysmal attacks of dyspnœa. At the autopsy gummy tumors were found in the liver, and the bronchial and tracheal glands were very much enlarged. The trachea at its point of bifurcation was compressed, and there was a point of suppuration in one of the cheesy glands which had resulted in perforation of the trachea just at its bifurcation. The dyspnœa was probably due to the bronchitis and compression of the trachea, while the paroxysmal exacerbations were the result of pressure on the laryngeal nerve.

#### CARCINOMA OF THE ŒSOPHAGUS.

The third specimen was one of very extensive cancerous disease of the œsophagus, with secondary involvement of the trachea. There were also secondary nodules scattered throughout the body.

Seven or eight weeks before the patient's admission to the hospital he had had some difficulty in swallowing, which increased rapidly, and for about ten days before death he was unable to swallow any food at all, being nourished by enemata. The liver increased very perceptibly in size during the patient's stay in the hospital. The point of special interest in the case was the rapidity with which the disease must have progressed, since there had been no symptoms of œsophageal trouble until a short time before the patient's admission to the hospital, at which time the carcinoma was already far advanced.

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*Stated Meeting, May 28th, 1890.*

DR. T. MITCHELL PRUDDEN, PRESIDENT PRO TEMPORE,  
IN THE CHAIR.

TUBERCULOUS ULCER OF THE TONGUE.

DR. CHARLES N. DOWD presented a patient, aged forty-two, suffering from tubercular disease, which had first manifested itself about two years ago by a fistula in ano. This was cut, but has never healed. About a year ago the patient began to have a cough, with night sweats, became weak, and emaciated steadily. He had had no hæmoptysis nor long-continued diarrhœa. About four months ago a large ulcer appeared upon the tongue, and the man came to Roosevelt Hospital for treatment. The ulcer was on the middle of the dorsum of the tongue, about one and one-half inches from the lip, and was on a hard base somewhat excavated. Those who saw the patient were at first doubtful whether it was a tuberculous ulcer or one growing on a carcinomatous base. A piece was removed and sent to the laboratory of the College of Physicians and Surgeons for examination. The result of the microscopical examination showed it to be a tuberculous ulcer pure and simple; tubercle bacilli were found in fair numbers. A study of the literature of the subject showed that the dorsum of the tongue was comparatively rarely the seat of tuberculous ulcers, especially the median line of the dorsum, the base and edges being the most common seats of the disease. The case was interesting also for the reason that the general symptoms were not to be accounted for by the signs present in the lungs. He had emaciation, progressive weakness, a cough, night sweats, and the fistula—all pointing to tuberculosis, but there were no pulmonary symptoms sufficient of themselves to warrant a diagnosis of tubercular disease.

DR. CURRIER said that he had several years ago seen a number of cases very similar to the one here shown. The burrowing was a very characteristic feature of the disease. The diagnosis, when the ulcer is on the edge of the tongue, is very difficult to make, espe-

cially if there happen to be a rough tooth which might be the cause of the abrasion. Neumann always laid great stress on the presence of degenerative changes at the apices of the lungs.

DR. J. S. ELY said that he gathered from Dr. Dowd's remarks that he laid some stress on the fistula as being the primary source of the tuberculosis. The speaker, however, could not well understand how the infection of the tongue could have come from the anal lesion without first the production of a general tuberculosis—in other words, the channel of infection must be through the blood circulation in such a case. He thought it was very probable that the man had miliary tuberculosis in his lung, and that infection occurred through the sputa, some bacilli being swallowed and thus leading to the fistula in ano, others lodging on the tongue and setting up the disease in that place. It would seem rational to assume that the ulcers should be on the tip or the edges of the tongue rather than on the dorsum.

DR. DOWD said that he did not at all wish to convey the idea that the tuberculosis of the tongue came by direct infection from the fistula. He agreed with Dr. Ely as to the probable source of the infection.

DR. PRUDDEN thought it worthy of remark that the diagnosis nowadays generally rests upon the microscopical examination, and this should be made with great care, since we would not be likely to find a great number of bacilli. He had seen three cases in the last four years, and in all of them the bacilli were very few. He thought it was the rule that, in these local lesions, the bacilli were not found in such comparatively large numbers as Dr. Dowd had seen in this case.

#### RECURRENT CARCINOMA OF THE THORACIC WALL.

DR. GEORGE C. FREEBORN presented some specimens with the following history: The patient, a woman aged thirty-two, had had the breast amputated for carcinoma. One year and a half later she was admitted into the New York Cancer Hospital, having a secondary growth in the cicatrix. The following description is taken from the records of the hospital: "At the site of the right breast there is a white cicatrix extending into the axilla and terminating at the median line of the anterior chest wall in an irregular cicatrix. Above and to the right of the cicatrix there is an irregular swelling over the third and fourth ribs. The mass is immovable and the skin is not attached to it. In the cicatrix are three small nodules, one lying at the junction of the costal cartilages with the sternum." On July 2d, at the urgent request of the patient, the growth was removed. On July 4th symptoms of effusion into the pleural cavity appeared, and these were markedly increased on the 10th, when the dressings were removed, but no signs of pus

could be found. The patient gradually grew worse, the chest symptoms increasing, and she died on October 19th.

*Autopsy.*—An irregular nodular mass, fifteen centimetres in length and eleven centimetres in width, occupied the right and anterior surface of the chest wall, and projected three or four centimetres above the level of the skin. Upon opening the thorax the right lung was found compressed backward against the spinal column by the new growth, which was found to fill completely the right thoracic cavity. Numerous secondary deposits were found in the lung, the diaphragm, and the liver. Upon making a vertical section through the tumor, the cut surface measured twenty-two centimetres in length and eleven centimetres in an antero-posterior direction. The growth had pressed inward between the ribs, which were, however, not involved. Microscopical examination showed the new growth to be an alveolar carcinoma. The special point of interest in the tumor was its rapid growth. On July 2d the only visible growth was removed, and in three months this large mass had been produced.

#### TUBERCULOSIS OF THE BREAST.

DR. JOHN S. ELY presented a specimen removed by operation from a woman about thirty-five years of age. She came to Bellevue Hospital complaining of a hard growth in the neighborhood of one breast, which extended toward the axilla. Examination showed one very hard nodule in the breast, and from that a chain of enlarged glands stretching toward the axilla. A diagnosis was made of tuberculosis, and the breast with the enlarged glands were removed together. Examination of the specimen showed the nipple drawn out, bearing evidence to the fact that the woman had suckled children. At the edge of the breast was one large gland which seemed to be the apex of a triangular chain broadening out as it approached the axilla. Microscopical examination of these glands showed them to be tuberculous, the proof of this resting upon the structure and the presence of tubercle bacilli. The question which presented itself was how this process had begun. The woman gave no evidence of tuberculosis in any other part of the body, although a very careful examination was made. In the absence of any other explanation he thought it not improbable that the tubercle bacilli had been absorbed through the nipple into the galactiferous ducts, and had been carried to the first glands, thence radiating out, as one would naturally expect. The wound of the operation had healed, and the woman was perfectly well at the time the presentation was made. Dr. Ely said that he imagined that, in some way or other, tuberculous sputum had gotten on to a rag which was used to cover the breast; the bacilli had then been carried into the openings of the galactiferous ducts. In looking up the literature of



the subject he had found several cases in which a similar explanation of the causation of the disease had been offered. Verneuil believed this to be a not uncommon mode of infection in cases of tuberculosis of the breast.

DR. PRUDDEN said that he should be disposed to be rather cautious in making so definite an assumption as to the way in which infection had occurred. As any one knows, an abrasion of the skin may occur without much notice being taken of it. He would prefer to regard the mode of infection suggested by Dr. Ely as the more probable one, though by no means as the only possible one.

DR. ELY said that in cases of local infection there was generally a local manifestation of the disease.

DR. PRUDDEN replied that this was not always the case. There were several cases on record in which there had appeared a local tuberculosis of the skin without the evidences of any injury locally.

#### MULTIPLE GUMMATA OF THE LUNG.

DR. R. G. FREEMAN presented some specimens illustrating this condition. There was no previous history of the case. The woman was about thirty years old. At the autopsy there was found a pelvic cellulitis, chronic oöphoritis, and a purulent salpingitis. The lungs were congested. A single round, whitish nodule, about one centimetre in diameter, was seen in the lower part of the upper lobe of the left lung just under the pleura. On closer examination three smaller nodules were found near by. These varied in size from one-fourth to one-half centimetre in diameter. On microscopic examination these nodules showed the structure of gummata. The lung tissue showed considerable interstitial pneumonitis. No gummata were found in other organs.

Syphilitic disease of the lung is rare. Many cases are reported as syphilitic pneumonia where the grounds for the diagnosis of syphilis are insufficient, and which are either chronic interstitial pneumonia or tuberculosis. T. Lang, quoting Petersen, gives statistics of one hundred and eighty-three cases of syphilis involving the different organs, as follows: Liver, seventy-nine; kidneys, thirty-four; spleen, thirty-three; lungs, eleven; heart, ten; brain, nine; intestine, seven. Dr. Northrup reported a case to this Society about a year ago, in which there were miliary gummata of the lungs, liver, kidneys, and lymphatics in a child nine months old.

#### ALTERNATE PARALYSIS DUE TO MULTIPLE AREAS OF SOFTENING IN THE PONS VAROLII.

DR. IRA VAN GIESON reported the following case: Bridget B—, forty years of age, admitted to Charity Hospital July 16th, 1889. One week before admission to the hospital she fell suddenly to the

ground. She got up again and was able to walk alone, but was weak in the left leg. On reaching home she became unconscious, and when she recovered from this she was aphasic and had left hemiplegia and right facial paralysis. The mouth was drawn to the left, and there was dribbling of saliva, and deglutition was difficult, especially for fluid. She remained in this condition for the next four months. Examination of the heart and lungs gave negative results. The aphasia became gradually somewhat better. About a week before death a persistent low temperature was noticed, the tongue became coated, and the woman gradually failed and died on December 16th, 1889.

*Autopsy.*—The lungs were œdematous, heart normal, liver fatty in spots, the kidneys showed the changes of a severe atrophic

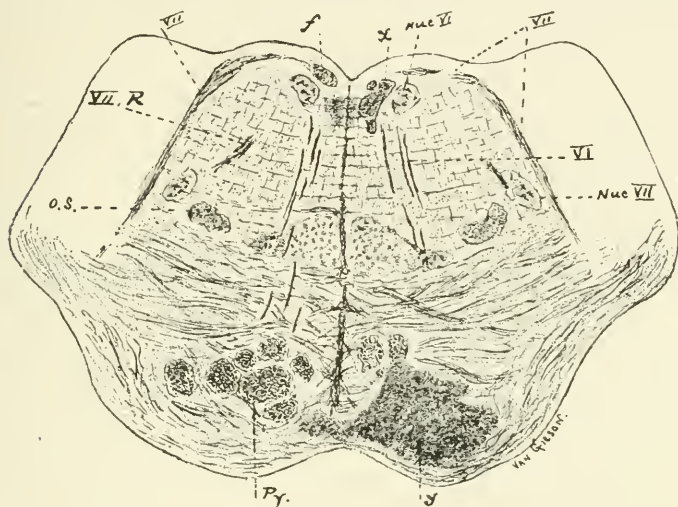


FIG. 2.—SECTION OF THE PONS, SHOWING THE SITUATION OF THE SOFTENED AREAS. *Py*, pyramidal tract; *y*, softened area involving the right pyramidal tract; *x*, area of softening involving the right genu facialis and a portion of the posterior longitudinal fasciculus of the right side; *f*, left genu facialis; *o. s.*, superior olive; *nuc. VI*, nucleus of the sixth nerve; *nuc. VII*, nucleus of the facial nerve; *VII R*, reflected fibres of the facial; *VI, VII*, sixth and seventh nerve roots.

chronic nephritis. There was nothing noteworthy about the other thoracic and abdominal viscera. The pia mater showed a few nebulous striæ over the convexity, and there was considerable subpial fluid. A section of the pons at its junction with the medulla showed a spot of softening confined to the right pyramid, and two small spots of softening, two to four millimetres in diameter, one situated between the left pyramid and the raphé, and the other in the floor of the fourth ventricle on the right side between the raphé and the nucleus of the sixth nerve.

*Microscopical Examination.*—Under the microscope these spots of softening were seen to involve the following structures: 1. Nearly the whole of the right pyramid as it passes from the pons to the medulla (Fig. 2). 2. A portion of the posterior longitudinal fasciculus of the right side and the right facial nerve bundle just as it turns downward to pass to its nucleus (Fig. 3). The right sixth nerve nucleus was not damaged by the softening. The facial nerve bundle was cut off from its nucleus by this minute area of softening, and in sections stained by Weigert's method the degeneration of its fibres (peripheral of the spot of softening) was shown very well. The degeneration of the facial nerve bundle was shown best in sections of the medulla above the spot of softening, in that portion of the genu facialis nearest the raphé, where the fibres are cut transversely as they pass downward and backward to the nu-

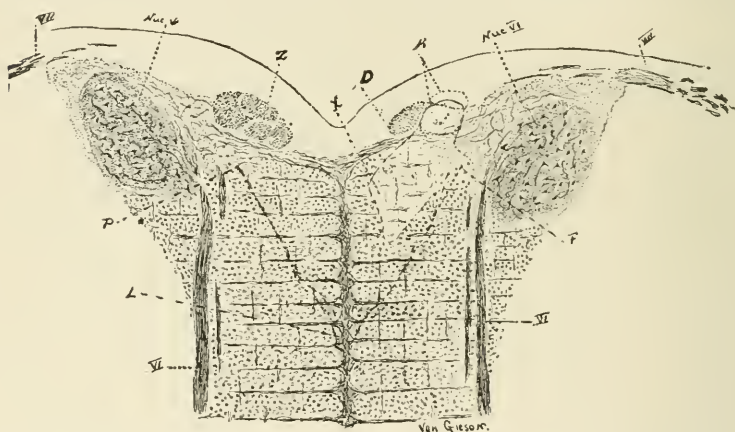


FIG. 3.—VII, Seventh nerve root; VI, sixth nerve root; nuc. VI, nucleus of the sixth nerve; P, L, F, posterior longitudinal fasciculus; Z, genu facialis of left side; L, K, genu facialis of right side, in which the bundles K are involved by the softened area X F, while the bundle O lies outside of the softened region.

cleus of the facial nerve. In such sections the genu facialis was very thoroughly degenerated.

The symptoms in this case corresponded very well with the lesions in the pons. The softening of the right pyramid produced the left hemiplegia, and the destruction of the facial nerve bundle in the pons on the right side caused the right facial paralysis, making the case one of alternate paralysis.

#### HEALED TUBERCULOSIS.

DR. T. M. PRUDDEN presented a specimen illustrating a localized so-called healed tuberculosis of the bronchial nodes. The lungs were removed from the body of a woman who had died from per-

icious anæmia. There were two little tubercles, one about three millimetres in diameter, and the other half this size. There was also pigment in the lymph nodes at the base of the lungs. Dr. Prudden said that he had presented the specimen because it was a good illustration of this not uncommon condition, and also because it showed how easy it would be to overlook tuberculosis of the lungs. If this lung had not been cut exactly right the lesion would have been overlooked, and it would not have been suspected that it was the source of infection.

#### SUPPOSED TUBERCULOUS INFECTION FROM THE PHARYNX.

DR. WILLIAM P. NORTHRUP presented some gross specimens and slides illustrating a case of retropharyngeal abscess, tubercular meningitis, and calcareous bronchial lymph nodes. They were removed from the body of a boy three and one-quarter years old. He was returned to the New York Foundling Asylum two weeks before his death, with no history except that the nurse said she was afraid he would smother in the night. When brought to the hospital dyspnoea was very marked. Fluids could be swallowed well, but there was a postpharyngeal swelling crowding the tonsils back out of sight. The swelling nearly filled the pharynx, was tense, slightly red, not tender, and apparently not acutely inflamed. The position of the head was constrained, and there was a moderate swelling on the left side of the neck. The abscess was opened through the posterior wall of the pharynx, and there was a free discharge of pus and disappearance of the tumor. One week before death the temperature gradually rose from 101° to 103° F. The head was rigid, but there was no pain on motion. The child became apathetic; there was moderate dyspnoea, vomiting, constipation, and screaming at night; pupils dilated widely; conjunctivitis; head turned to right; limbs rigid; so remained, and died without convulsions.

After opening of abscess there were no symptoms of dyspnoea or dysphagia. Child developed ordinary symptoms of meningitis of tubercular variety, having the usual outward appearances, not omitting the scaphoid abdomen.

*Autopsy.*—Body: Emaciated. Brain: Convolutions flattened; fluid escaped to the amount of several ounces (two to four); excessive number of fine miliary tubercles everywhere in the pia mater; no cloudiness or exudate at base, for instance about optic chiasm; ependyma granular, ventricles enlarged twice; no nodules in brain.

Pharynx: Abscess cavity capacity two drachms, or rather less, to left median line reaching from level of atlas to fourth vertebra, irregularly ovoid, having long axis parallel to axis vertebral column. Abscess empty; operation wound patulous. Mucous mem-



brane of pharynx showed enlarged follicles, no tubercles. No caries of spine; abscess submucous and no sinus leading from it. Retro-pharyngeal nodes enlarged, not tubercular.

Lungs: Bronchitis, congestion, and oedema; no consolidation, no tubercles. Bronchial nodes large, red, and soft. No recent tubercles. On further careful examination in alcohol, while cutting in series transversely, a long, narrow chalky mass, flattened up against the trachea, was encountered. This was obviously the remains of a fused mass of broken-down, cheesy nodes, and might easily have been overlooked.

Liver: Normal, anæmic.

Spleen, kidneys, stomach, intestines normal.

*Microscopical Examination.*—Tubercles and tubercle bacilli were found in the meninges, but none in the abscess wall or tissues about it.

The interest in this case resides in the fact of the presence of tubercular meningitis with retropharyngeal abscess, and the single chalky mass. The speaker said that he had recently presented before this Society a case of general tuberculosis having its oldest process in the mesenteric lymph nodes, with no tubercles at all in the bronchial lymphatics. It is the usual experience, in autopsies on children, to find the oldest tuberculous process in the nodes grouped around the largest bronchi near the tracheal bifurcation and at the root of the lung. When this autopsy was made the question arose as to whether the retropharyngeal abscess was not the beginning and the meningitis the ending of the same disease. The bronchial nodes appeared normal in the fresh state, and this seemed to rule them out, but the subsequent examination revealed disease. The case seems to emphasize two points, viz.: 1. The value of searching for the oldest tuberculous process, and that most carefully. When this specimen was placed in alcohol for further examination, it was believed to have been ordinarily well looked over and searched for cheesy centres. It was a matter of surprise, then, when the razor grated against the long, chalky mass. 2. The case also emphasizes the fact, so often observed, that if a very large percentage of cases are carefully examined, the oldest process will be found in the lymph nodes clustered about the respiratory ways.

DR. G. C. FREEBORN presented, on behalf of DR. J. WEST ROOSEVELT, a series of specimens illustrating

#### IMPROVED METHODS FOR MAKING CORROSION PREPARATIONS OF THE LUNGS.

Last year's Proceedings of the Pathological Society contains an account of a method for making corrosion preparations in which chromic acid was the principal corroding agent. Further work in this kind of study has produced better specimens, and has caused



me to change, and I think to improve, the technique sufficiently to justify this report. The value of corrosion for the understanding of much of the anatomy of viscera is not enough appreciated. It is usually looked upon as a very difficult process, and one which is hardly worth following.

I will venture to say that *not one anatomist in a thousand can form even an approximate idea of many details of visceral anatomy, unless he pursues this method.* Moreover, every anatomist will save much time and trouble by it.

My own experience is mainly with lungs, and the methods here described apply mostly to them.

#### HOT INJECTION MASSES.

The best white mass known to me is paraffin of high melting point mixed with white wax. It is, unfortunately, impossible to specify the kind of paraffin, as commercial specimens vary so much. The formula may be given as follows: Paraffin of high melting point, from four to six parts; white wax, two parts. The proportions must be so varied that a mass remaining fluid at from 50° to 60° C. results. Such a mass will stand, with proper care, our New York summer, if strengthened with varnish in the way to be described. It makes a beautiful, glistening white substance, which takes very accurately the form of the bronchi, but which shrinks considerably on cooling, and is very brittle in cold weather. It is very beautiful to the eye, however.

If it be not necessary to have a pure white, the following mass is stronger and does not shrink so much: Paraffin of high melting point, six parts; white wax, two parts; resin, one part; Venice turpentine, one part. This and the following mass are brownish-yellow, unless color be added.

A hot mass which is very good for lung injections may be prepared as follows: Paraffin of high melting point, four parts; white wax, two parts; resin, one part. Melt the resin and wax together, then add the paraffin. The melting point of the mass may be lowered by adding some paraffin of low melting point. This should be done carefully, as too much makes the preparation bend in hot weather. A mass which remains fluid at 55° or even 60° C. is fairly safe to use. For colors, English vermilion gives the best red; Prussian blue, or cobalt, ultramarine, or Chinese blue, are good blues; chrome yellow, chrome green, and Paris green all give good colors in hot masses.

It is important to remember that many fraudulent pigments are sold. In colors ground in oil there is a so-called vermilion which is bleached by HCl. "American vermilion" will not stand the acid. Many "ultramarines" also are bleached by this agent and by chromic acid.

Messrs. Abraham Brothers, of 473 Sixth avenue, to whom I am indebted for much information about pigments, have ground all those mentioned in oil for me, and have taken pains to procure satisfactory specimens. It is an immense advantage to mix the colors thus ground in oil with the mass, rather than to attempt to mix them dry. The amount of pigment used depends on the color desired. It must be remembered, however, that all of the pigments tend to sink, especially vermilion. The masses must, therefore, be continually agitated or stirred until used. A good way to obtain an even color is to mix experimentally the pigment with the hot mass, from time to time pouring a little of the mixture into cold water. When the proper tint is obtained the whole mass may be poured into a cold flat dish and stirred, as it cools, with a spatula. When it becomes sufficiently stiff it may be cut up into small pieces. In this way the sinking of the pigment is prevented.

In using hot masses, the procedure best for the lungs differs somewhat from that which seems to give the best results in solid viscera. In the lungs it is far better that the organs be cold before the injection is begun. If they be warmed the air vesicles and finer bronchi are apt to be filled, and thus the organ is rendered practically solid. In solid viscera better results are obtained by heating them to about  $50^{\circ}\text{C}.$  or even higher. The general principle obtains in all cases: If we wish to inject a gland we fill first the duct, then the artery, and lastly the vein. In the lung, fill first the bronchus, then the pulmonary arteries, lastly the vein. The heat imparted to the lungs by the bronchial injection suffices to retain the fluidity of the masses in the artery, and this heat, with that added by the arterial injection, suffices for the mass in the vein.

It is a curious fact that the pigment employed, both with hot and cold masses, seems somehow to affect their physical characters. Vermilion, which is the best red, makes hot paraffin masses solidify very suddenly. It is very hard to inject pulmonary vessels, when the lung is cold, with a vermilion mass, while it is easy to do so with a cobalt or Prussian blue mass, and still easier with an uncolored mass.

*Details of Injection with Hot Masses.*—Use canulæ as large as possible. Glass is on the whole the best material for canulæ. Pure tin pipe may be used. This metal is very easily shaped, and, as it is dissolved by acids, there is sometimes an advantage in using it, as it is possible to mount some specimens more prettily when the tubes are thus dissolved. Very small tin pipe is easily obtained.

In tying the canulæ use strong linen twine rather than silk, as it is easier to manage. One small matter which I have learned has saved me much trouble. To prevent canulæ from pulling out of vessels, simply, after tying, cut the ligature long, slip the free ends through a short piece of rubber tube, and slide the latter over the

canula, which it should fit tightly. Now pull the ends of the ligature tight, and the rubber will prevent the vessel from slipping off the tube. (See Fig. 4.)

Having tied the canulæ in the vessels, if the organ which it is desired to inject be a solid viscus it should be warmed by prolonged immersion in a large vessel filled with water which is maintained at the desired temperature (for paraffin masses which are fluid at 55° the organ should be heated to at least 48° to 50°, and possibly to even a higher temperature); my own experience is mostly with lungs, which do not require warming). The best injecting apparatus known to me consists of a small double-necked Woulff bottle made of thin glass to contain the mass, with suitable apparatus for compressing air. Air pressure may be obtained in any way. Personally I have found an ordinary foot blowpipe bellows the most

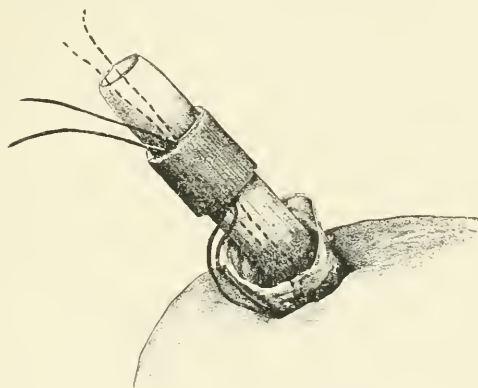


FIG. 4.—METHOD OF TYING CANULA.

satisfactory in lung preparations. The pressure in these specimens may reach ten to twelve centimetres of mercury without risk. The hand placed upon the lung gives a sure guide, to one with experience, as to the progress of the injection. When enough of the mass has flowed in, gentle pressure gives a feeling like that of a number of needles beneath the pleura. It is easy to appreciate this when the bronchus alone is filled, but it is harder to feel the arterial and venous injections when these succeed that of the bronchus.

The time necessary sufficiently to fill the bronchi, pulmonary artery, or vein is very short. It is not more than a minute, and is rarely more than half a minute, for each. With solid organs it is longer. (As has been said, my experience is almost entirely confined to lung studies, and I know but little about making preparations of other viscera.)

My method with lungs is as follows: The chest is opened carefully, so as to avoid cutting its contained viscera.<sup>1</sup> The lung to be injected is first carefully freed from any adhesions. The pericardium is now opened and the heart removed, taking care to cut through the wall of the left auricle in such a way as to leave plenty of tissue to tie around the canula which is to fill the veins, and also to cut the artery at some distance from the lung. The bronchus is next cut close to the trachea. The base of the lung is next lifted up and the *ligamentum latum* cut as close as possible to the vertebral column. The lung is removed from the chest, and canulae are tied into the bronchus and vessels to be injected. It is advantageous to introduce canulae into bronchus, artery, and vein, even if it is not desired to inject all these tubes; for by attaching a funnel by a rubber tube to those not injected, and elevating it, acid may be made to flow into the inner parts of the organ as soon as the desired portions are injected, and the corrosion process hastened.

The canulae, as I have said, should be as large as possible. The

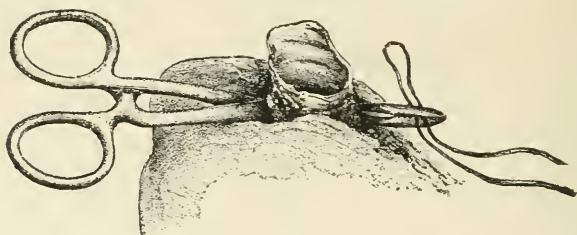


FIG. 5.—FORCEPS PASSED THROUGH TISSUE CLOSE TO THE TRACHEA, in order to draw the ligature through, thus holding it more firmly when the canula is introduced.

ligatures are most securely and easily fastened if a forceps is run through the connective tissue which surrounds the bronchus or vessel, and the cord seized and drawn back with it, as shown in Fig. 5. This leaves a mass of connective tissue beneath which the ligature passes, and which practically fastens it close to the end of the canula.

The canulae having been inserted, short, wide rubber tubes are slipped over their free ends. These tubes should be long enough

<sup>1</sup> If both lungs are to be injected, it could doubtless be done so as to give the most correct relations of all the parts, if the chest were not opened and a canula were fastened in the trachea, another in the descending cava; and after the trachea and bronchi were sufficiently injected, the abdomen might be opened and the inferior cava ligated. The right heart, coronary veins, and pulmonary artery might then be injected with a pretty hot blue mass. Next the thorax might be carefully opened and a third canula introduced into the left auricle and the aorta be clamped. Through this last canula an injection could be introduced into the pulmonary veins, left heart, and coronary arteries. The whole wall of the thorax can be dissolved in acid, and it is probable that most beautiful and topographically accurate specimens could thus be made. I have had no opportunity to try this, however, and my specimens were made from lungs removed from the chest.

easily to reach the Woulff bottles and to allow sufficient movement of these latter, but they should be as short as possible.

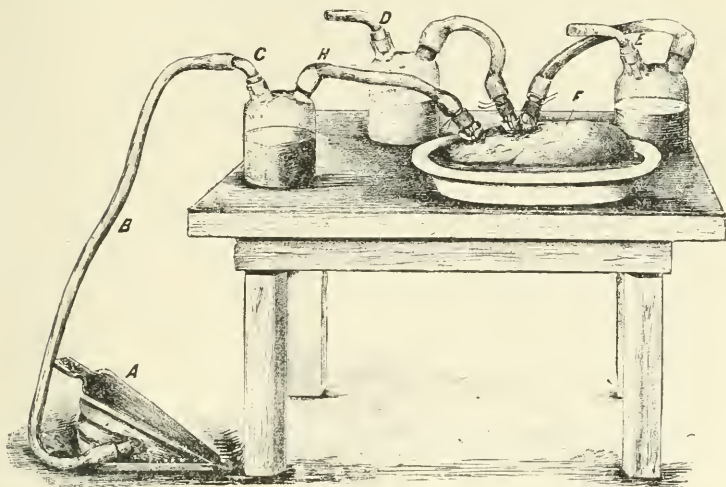


FIG. 6.—ARRANGEMENT OF INJECTING APPARATUS.

Each tube is now attached to one neck of the appropriate bottle, which latter has already been filled, about four-fifths full of a

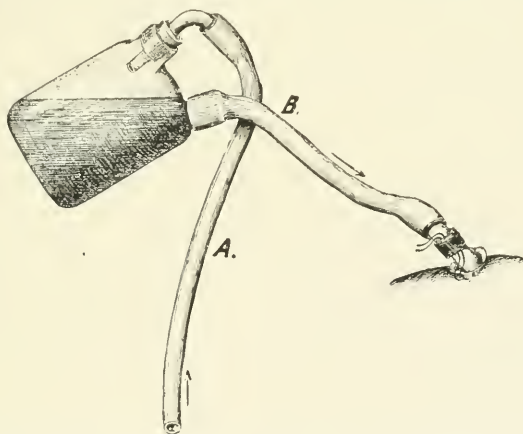


FIG. 7.—BOTTLE TILTED SO AS TO ALLOW THE MASS TO FLOW THROUGH THE TUBE INTO THE ORGAN.

mass of the required color. The bottles remain immersed in hot water until their contents have been used. The organ is next placed in a dish partly filled with a melted mixture of paraffin,



wax, and resin, or with paraffin alone. In this it sinks more or less. The procedure with lungs and with more solid viscera is now somewhat different. For the lung the next step is to insert the tube which delivers compressed air into the free neck of the bottle which is attached to the bronchus (Fig. 6, C). The bottle is at first allowed to remain in an upright position, so that air can enter the bronchus without introducing the mass. Pressure is then applied until the lung seems completely inflated. The bottle is then tilted, as in Fig. 7, and the pressure slightly increased. The mass now runs into the bronchus. When enough has run in, a clip is applied to the tube H and the bottle is disconnected. A little cold water may now be poured over the canula. The artery is next injected. It will be found advantageous to inject a little air into this vessel (though of course not so much as into the bronchus), and the injection is made in the same way. Before injecting the vein it is well to pour over the entire lung some of the same mass as that in which it has been floating. This encloses both lung and canulae in a sort of shell. The vein is next injected. Air should not be injected before the mass into pulmonary veins, however.

The next step is to cut off the tubes and as much of the canulae as seems best, and to fasten the various injection masses to one another and to a suitable support. In order to cut a glass canula it is only necessary to file a deep notch in it and then to apply a red-hot iron to it. The mass within it will at once melt and the glass will break. A piece of hard rubber of the right size may be placed in contact with the canula thus cut off. A piece of resin is placed in contact both with this rubber and the injection tubes and masses. A rather hot soldering iron is now applied, and the rubber, resin, and masses are melted together. Of course it is only advisable to melt the surface of the rubber. The lung is now completely injected. The various tubes are properly fastened, and the whole organ is covered with a shell of paraffin, etc., and lies evenly supported by the same material. We now have the organ imbedded and the tubes immovable. As soon as the imbedding mass is moderately firm, a small hole is cut in the layer above the organ, and strong hydrochloric acid is allowed to flow through this hole until it completely covers the preparation. The corrosion will be hastened if an arrangement be made which allows the acid to flow very slowly through this hole in a small stream from a vessel slightly elevated above the organ for several hours. (See Fig. 8.)

The length of time required for the corrosion to take place varies within wide limits. Forty-eight hours may suffice with adult human lungs, or two weeks may be hardly long enough for complete solution. Of course the size and structure of the viscus and the strength of the HCl influence markedly the time, but even viscera of similar size and structure treated with HCl of the same

strength, for some reason to me unknown, may require very different times for the acid to do its work.

When the tissue of the organ becomes semi-solid, the specimen is

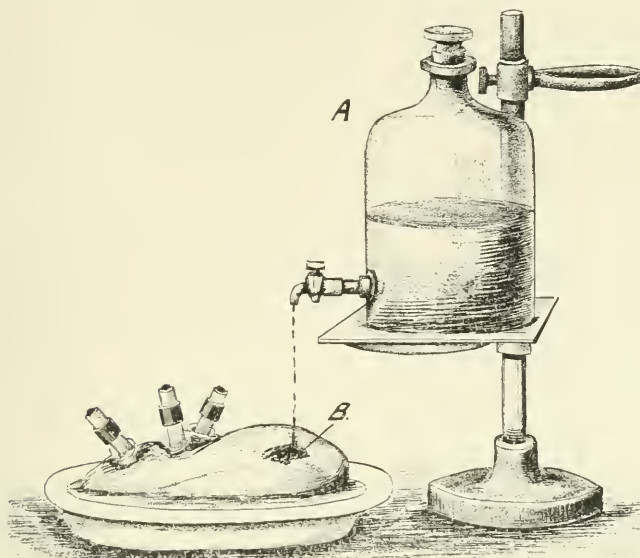


FIG. 8.—BOTTLE ALLOWING HCl TO FLOW SLOWLY FROM STOPCOCK OVER LUNG THROUGH (B) HOLE IN THE PARAFFIN COVERING.

washed with a stream of cold water until entirely clean. In order to do this the imbedding mass which covers the upper surface of

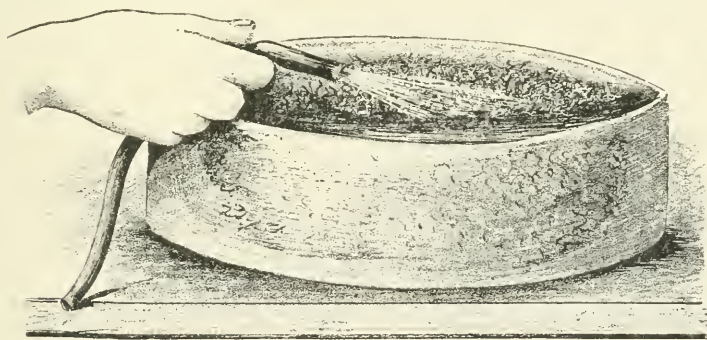


FIG. 9.—METHOD OF WASHING PREPARATION.

the viscus is entirely cut off, except near the tubes. The specimen now lies surrounded below and at the sides by the imbedding mass, which makes a sort of dish, to which it is fastened. A stream of

water is now played upon the exposed surface. Personally I use a rubber tube attached to the Croton faucet. By compressing the end of the tube I can produce a stream of any desired size, and by regulating the faucet the force may be varied as seems best. It is stated that specimens can be washed perfectly if placed in a slowly flowing stream of water, but I have not succeeded with this method.

It remains, after the preparation is clean, to mount it. In order to do this it must be removed from the imbedding mass. By far the best way known to me for freeing it from this mass is by cutting it out with a galvano-cautery. If this be not available a hot iron will serve.

In dealing with solid viscera it is necessary, as has been said, to warm them. They are probably most conveniently injected when immersed in hot water. It seems advisable to inject a little air before the mass is run in, even in these specimens. In order to handle them it is certainly, as far as my experience goes, advantageous to remove them while still hot from the water and place them in paraffin or paraffin, wax, and resin. The process, as far as I know, is the same as that employed with lungs.

Plates I. and II. represent the finer anatomy of the pulmonary lobules as demonstrated by this method.

*To Preserve Specimens.*—The preparations, having been washed clean and dried, should be sprayed with a weak solution, in ether and alcohol, of gum sandarac and collodion. The spray must be applied in successive coats. After thus varnishing them they should be placed under glass.

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*Stated Meeting, September 24th, 1890.*

DR. H. P. LOOMIS, VICE-PRESIDENT, IN THE CHAIR.

#### TUBERCULOSIS OF THE PERICARDIUM.

DR. H. M. BIGGS presented some specimens removed from the body of an Italian who died in Bellevue Hospital. He was admitted to the hospital thirty-six hours before death, having at that time a weak and rapid pulse and a distended abdomen, but no history of his illness could be obtained, and he died without any diagnosis having been made. At the autopsy there was found to be tuberculosis of the peritoneum of the usual type. The lungs were adherent on both sides, the adhesions being very extensive, but no tubercular lesions were found in them. The two layers of the pericardium were adherent, and between these two layers were two large and a number of small cheesy masses. The large mass was about six centimetres in diameter and two centimetres in thickness, and was surrounded by very dense connective tissue. These specimens illustrated an unusual type of tuberculosis. Apparently it

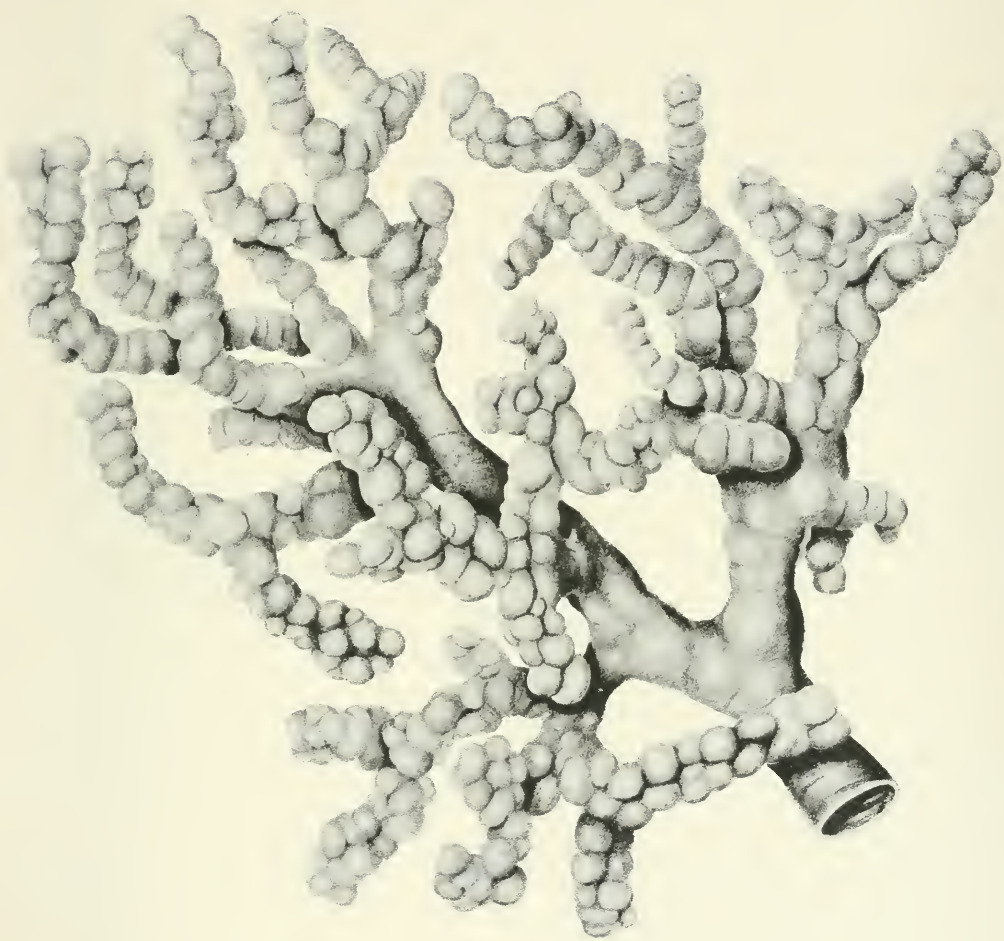


PLATE I.







PLATE II.



was a case of primary tuberculosis of the pericardium in which recovery had seemingly taken place, the tubercles having become surrounded by connective tissue. Dr. Biggs believed that there had also been a pleuritis as well as a pericarditis, and this had given rise to the adhesions. He thought that it was not infrequent that in tuberculosis of the pleura, the tubercles, being small, later degenerated and became absorbed, leaving no trace of their presence. Of course it was not possible to prove this view. The bronchial glands in this case were apparently not enlarged.

#### BILIARY CALCULUS.

DR. R. G. FREEMAN presented a biliary calculus which had been removed from the body of a woman, forty-five years of age, who was poorly nourished and somewhat jaundiced. The specimen nearly filled the gall bladder, and fairly represented its shape. It was surrounded by a little grayish-looking fluid. This stone, which was five and one-half centimetres long and two and one-half centimetres in its greatest width, weighed nineteen grammes. On section it was found to consist chiefly of inspissated bile, and contained two cholesterol stones—one at the neck, one and one-half centimetres, and the other at the fundus, one centimetre in diameter. The cystic duct was impervious.

Dr. Freeman also presented a gall bladder which had been obtained by Dr. Hodenpyl from the body of a man, sixty-nine years of age, who died from an injury received while in apparent good health. The autopsy showed endocarditis and interstitial myocarditis, the pneumonia of heart disease, cirrhosis of the liver, interstitial pancreatitis, and chronic diffuse nephritis. The gall bladder was hard and its walls greatly thickened. It contained a number of small biliary calculi. The cystic duct was pervious.

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*Stated Meeting, October 22d, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

#### PSEUDO-LEUKÆMIA.

DR. WILLIAM P. NORTHRUP presented a report of such a case, illustrated by microscope specimens showing a lymph node and the small bodies found in the spleen and liver. The history covered a period of thirteen months previous to the death of the child, and began with the statement of the nurse that a lump appeared on the side of the neck about two months before she returned the child to the New York Foundling Asylum for inspection. The patient was aged four years and two months. Examination showed a large mass occupying the right side of the neck, consisting of small, dis-

crete tumors like enlarged nodes, which were fairly movable. The overlying skin was normal, and the patient's general health good. During the last year of life the child contracted scarlatina, from which he recovered without nephritis. The tumor steadily increased in size, and six months before death Dr. Poore, the consulting surgeon, performed an exploratory operation. He removed a number of enlarged lymph nodes, which were reserved for examination, but it was found impossible to remove all. The child made a good recovery from the operation, but about this time the patient passed into a decline, which was marked by pronounced anæmia, anorexia, enlargement of numerous other lymph nodes throughout the body, enlargement of the spleen, and rapid and feeble heart action, irregular and sudden marked increase in the temperature, accompanied by rapid respirations, sixty or more per minute, and a pulse of 200. Physical examination of the lungs remained negative throughout the course of the disease. In the intervals between the exacerbations referred to the child was fairly comfortable, except for a diarrhœa which grew gradually more severe and finally became uncontrollable. For two weeks the respiration was croupy, noisy inspiration and expiration, and this was thought to be the result of pressure of the tumor. Death occurred thirteen months after the first symptoms were observed.

At the autopsy the body was found to be emaciated, and a diffused swelling on the right side of the neck extended from the ear to the clavicle, bounded in front by the median line, and behind by the shoulder. An incision into this region showed a collection of nodes reaching from the ear to the axilla, and closely resembling a large bunch of grapes. When removed, the mass brought with it the middle third of the clavicle. The lymph nodes varied but little in size, and each was surrounded by a separate capsule of thickened fibrous tissue. The nodes, on section, were white and glistening, firm and not cheesy, and were totally unlike tuberculous nodules. Large, isolated lymph nodes were also found in the left axilla and in both inguinal regions. The lungs were quite œdematous, and contained fine miliary bodies like tubercle, and scattered areas of consolidation. The bronchial lymph nodes were neither cheesy nor chalky, and were not tubercular. The liver contained dull-white, stellate, and irregularly shaped masses, varying in size from two to six millimetres, and the lymph nodes at the portal entrance were large and white, but not cheesy. The spleen was much thicker than normal, irregularly nodulated on its surface, which showed indistinctly, before section, small white bodies. On section, these bodies, which were plainly visible against the dark background of splenic tissue, appeared like irregular masses of fat scattered thickly through the organ. The kidneys were pale, and the markings normal, but no white bodies were present. The stom-

ach and intestines showed only a moderate catarrh. The cervical, axillary, mediastinal, retroperitoneal, and inguinal lymph nodes were only moderately enlarged, being about the size of the domestic hickorynut. There was marked anæmia, with moderate œdema of the mediastinum and peritoneum, but none of the legs. The microscopical examination of these lymph nodes, and of the areas already described in the liver and spleen, showed small round cells in abundance, spindle cells, giant cells, polygonal cells, and new blood vessels. The blood had been examined, but not properly. So far as the examination went, it showed no very marked change in the relation of the white to the red blood corpuscles. The structure seen under the microscope seemed to him very much like that of a sarcoma.

DR. T. MITCHELL PRUDDEN spoke of the confused nomenclature of this disease. The term lymphadenitis was particularly objectionable, for the parts principally involved were not the glands, and these tumors in their growth did not produce a glandular structure. He thought the term *adenie* was the least objectionable of the many that had been proposed.

#### PACHYMENINGITIS INTERNA HÆMORRHAGICA.

DR. E. D. FISHER presented a report of such a case, and exhibited the brain. The patient was a man seventy-two years of age, an inmate of the almshouse, and apparently in good health before the attack. Suddenly one evening, about nine o'clock, he was noticed to be breathing noisily, and on summoning the physician the patient was found to be unconscious, with stertorous respiration, full pulse, unequal pupils, but with no signs of paralysis. There were no other symptoms up to the time of his death, on the following morning. The history seemed to bear out the diagnosis made at that time, of apoplexy, or intracerebral hæmorrhage. Dr. Fisher said the autopsy showed all the organs to be healthy, with the exception of the brain. On the right side, between the dura mater and pia, there was an effusion of blood, one portion of which was enclosed in a distinct membrane. This looked as though there had been a previous inflammation of the dura, giving rise to an increase of tissue. The effused blood did not seem to come from any other portion of the brain except the new tissue which had formed in the course of a pachymeningitis. The brain showed no pressure on the convolutions at the site of the hæmorrhage. The arteries exhibited marked atheromatous degeneration. Although these cases are spoken of in the books as rare, they occurred with comparative frequency in the almshouse, and almost always had a previous history of alcoholism, and frequently also of syphilis. He desired to know whether an examination of the specimen would throw any light upon the character of the hæmorrhage, and also how fre-



quently these cases are met with at necropsies. It had been considered that this condition was not uncommon in general paresis of the insane; but he had witnessed many necropsies on such cases, and had not found it very frequently present.

DR. H. M. BIGGS said that his pathological observations included many of those who died in "the cells" of Bellevue Hospital, and among these this condition was by no means infrequent. This fall he had seen at least three cases of pachymeningitis with cortical hæmorrhage and death. The subject was of great practical importance, in view of the advances made in cerebral surgery. It seemed as though there should be some way of diagnosing cortical from intracerebral hæmorrhage. He had frequently seen cases of cortical hæmorrhage where an operation would apparently have given relief. It was not only in these cases of pachymeningitis with cortical hæmorrhage, but in cases of traumatism, with or without fracture of the skull, where there was little or no laceration of the brain—and there were a great many of these—that the chances of recovery would be excellent if a correct diagnosis could be made. So far as he had been able to learn the clinical history of these cases, paralysis was not usually present, but when it did exist it was not on the same side as the lesion, and was apparently due to increase of intracranial pressure. On the side opposite to the lesion there was much more likely to be rigidity than paralysis. Coma, when present, was usually profound, and there was generally some irregularity of the pupils.

THE PRESIDENT asked Dr. Biggs if in his experience pachymeningitis, with a thin membrane, was not commonly found in cases where there was no particular evidence of hæmorrhage—in other words, where the clinical picture was that of apoplexy.

DR. BIGGS replied that he had frequently seen cases where the membrane was of considerable thickness—about one-sixteenth of an inch—in which death occurred without evident determining cause, and where there were no recent hæmorrhages or signs of pressure.

THE PRESIDENT said that he had observed cases in which there was general disease of the larger cerebral vessels with symptoms of apoplexy, but without hæmorrhage, in which sudden death had occurred, sometimes with a convulsive attack on the side which was subsequently paralyzed. He would like to know about the frequency with which such cases occur.

DR. FISHER said that in Gowers' recent work they are spoken of as rare.

DR. HOLT had met with two cases in children, in about four hundred and fifty autopsies.

DR. NORTHRUP stated he had reported to the Society five or six cases occurring in children, and in his experience it was quite frequent among asylum children. In answer to a question from

Dr. Biggs as to whether he had found in children the same kind of hæmorrhages as in adults, he replied that small hæmorrhages were very common, but they occurred in poor, miserable children where there were other causes more likely to produce death. The hæmorrhages were usually punctate; and he did not recall having seen a layer thicker than blotting paper.

CEREBRO-SPINAL MENINGITIS IN AN INFANT DUE TO THE DIPLOCOCCUS PNEUMONIÆ OF FRAENKEL AND WEICHELBAUM.

DR. L. EMMETT HOLT presented a report of such a case, and DR. T. MITCHELL PRUDDEN presented a report upon the bacteriological examination of the specimens, and the demonstration of the presence of the pneumococcus. He also exhibited the cultures and slides showing the pneumococci from the exudate.

Similar cases to this one have already been reported in German medical literature, but this is believed to be the first one recorded in this country.

*Clinical History* (Dr. Holt).—The patient was a female child, thirteen months old, an inmate of the New York Infant Asylum. She was, previous to the illness here recorded, in excellent condition and nursed by the mother; there had been a slight cough but no other symptoms prior to October 8th. While standing in her crib on the afternoon of this date, the side became detached and the child fell to the floor, a distance of about two feet, striking upon the chest and forehead. She cried considerably, but in two hours was bright and in all respects natural. There was an attack of vomiting during the night, but she slept quietly, and the next morning seemed perfectly well, excepting that ecchymosis existed beneath the left eye. Nothing abnormal was observed during this day until toward evening, when she became very fretful and feverish, and at eight o'clock she was taken with severe vomiting, which was repeated at short intervals during the night. The temperature rose rapidly to 103° F., and from this time remained steadily high. Slight convulsive movements of the face were observed once during the night.

From the onset of severe symptoms and vomiting the illness lasted just eighty hours. Vomiting persisted during the whole attack; the bowels moved regularly once or twice daily. The temperature remained steadily high, from 102.5° to 105.5° F.; pulse rapid, but regular; respirations 48 to 54 per minute. The prostration was very marked and steadily increased. General cyanosis was quite prominent throughout the illness; this, with the rapid breathing and persistent high temperature, led to the suspicion of pneumonia, but repeated examinations of the chest revealed only very rude respiration on both lungs, no râles, and no signs of consolidation.

There was, for the first two days, general nervous irritability, but

no delirium. During the last eighteen hours only were there any decided nervous symptoms. Drowsiness was first observed, this gradually merging into stupor; with this there was a slight amount of rigidity in the lower extremities, and a little later convulsive twitchings were seen in the right face and arm. The stupor steadily increased and she died comatose. There was at no time opisthotonos, retraction of the abdomen, pupillary disturbances, or constipation. The prominent symptoms were persistent high temperature, vomiting, prostration, and cyanosis, with the nervous symptoms above noted during the last eighteen hours.

*Autopsy*, seven hours after death. Body well nourished. Large ecchymosis beneath left eye, but bone and dura mater normal in the corresponding region; no subdural hæmorrhage; non-adherent thrombi in the superior longitudinal and lateral sinuses, thrombi in many of the cortical veins leading to these sinuses. There was a very abundant exudation of lymph and pus, which enveloped completely the anterior half of the brain; posteriorly it was seen in scattered patches. Exudation rather less abundant at the base than over the convexity. Lateral ventricles not distended with fluid. The spinal canal was lined by a thick layer of fibrin and pus, chiefly posteriorly, the exudation being rather more abundant above than below. The dura externally was covered with this exudate upon its posterior and lateral surfaces, but none was present in front. The inner surface of the dura and the pia mater were congested, but otherwise normal. No tubercles in brain or cord. The lungs were uniformly congested, but there were no areas of consolidation or collapse. Pleura normal. The heart contained adherent decolorized thrombi, which extended into the pulmonary artery and the aorta. Pericardium normal. Spleen slightly enlarged, otherwise normal. Liver normal. Kidneys showed moderate cloudy swelling of cortices. Alimentary tract normal.

*Bacteriological and Microscopical Study of the Brain and the Lungs* (Dr. Prudden).—Cultures were made five hours after the autopsy, from both the brain and the lungs, on plates of agar and glycerin-agar, and kept in the thermostat at the body temperature. On the plates made from the exudate of the pia, only one variety grew, and that in large numbers. This growth on the agar plates was in the form of grayish, inconspicuous, translucent small colonies, which very soon died out and could be no longer transplanted with success.

Transfers made to tubes in from twenty-four to thirty-six hours showed the same growth on agar. There was no growth on gelatin at the room temperature, and no growth on potatoes.

Morphologically these germs were very short, often lance-head-shaped, and mostly in pairs, presenting, however, considerable variation in shape, the diplococcus form predominating.

Inoculations were made either subcutaneously or into the pleura in white mice (two animals), and death ensued in about thirty-six hours. The post-mortem examination showed a moderate fibrinous exudate of the pleuræ, congestion of the posterior lobes of the lungs, and a large, soft spleen. The blood from the heart and the exudates showed large numbers of short-paired bacilli with translucent capsules.

A replanting of the exudates and blood from the heart gave a new set of pure cultures similar to those made from the brain of the child. Cultures from the child's lungs showed the prevailing bacterium to be the same as that which was so abundant in the cerebral exudate.

The morphological, biological, and pathogenetic characters of this germ, then, suffice for its identification as the diplococcus pneumoniae of Fraenkel and Weichselbaum.

Sections of the inflamed pia, stained for bacteria, show that in places the exudate, pushing apart the layers and fibres of the pia, is crowded with the pneumococcus. The lung shows, in addition to its congestion, a very slight amount of exudation here and there into the air vesicles, and a moderate degree of inflammation of some of the smaller bronchi.

*Remarks.*—It seems to be pretty well established by the researches of the past few years that the pneumococcus of Fraenkel and Weichselbaum is the bacterial etiological factor in the infectious disease acute lobar pneumonia. But these same researches have shown that the diplococcus pneumoniae has another and a very significant rôle among the pathogenic bacteria. It has been repeatedly found, either alone or in association with other germs, in several of the not infrequent complicating lesions of acute lobar pneumonia, such as suppurative meningitis, endocarditis, etc. It has been also shown that, apart from pneumonia, this germ is capable of setting up suppurative inflammations in various parts of the body, as in the middle ear, joints, etc. The case is an excellent example of this particular lesion of the brain and cord, which has already been shown in a considerable number of cases to be associated with the pneumococcus.

Two points are worthy of notice in connection with the clinical history. The first is the early predominance of pulmonary symptoms, rapid breathing, cyanosis, etc., and those of a cerebral character. This appears to show that the effects of the infection were felt to a considerable degree in the lungs, even though the principal lesions were in the central nervous system. This seems not unnatural, since the diplococcus is more frequently the cause of pneumonia than of other inflammations.

The second point is the rôle played by the traumatism. This was definite and quite severe, and occurred just twenty-four hours before the onset of active symptoms. Was it simply a coincidence?



It seems more likely that this may have been the factor which determined the brain, rather than any of the other organs, as the seat of disease.

No other cases of cerebro-spinal meningitis had been seen in the institution for a year, and no cases of pneumonia have occurred this season in the building which this infant occupied.

DR. WALTER MENDELSON said that every observer was impressed with the great disproportion between the nervous symptoms and the extent of the pathological lesions in this disease. He had had an opportunity of witnessing many cases while in the New York Hospital, and he recalled very distinctly what great variations they presented. One case, presenting but few symptoms, would be found on post-mortem examination to exhibit an abundant exudation of pus over the brain and spinal cord; while in another, with marked nervous symptoms, perhaps only a few small patches of exudation here and there would be seen. This forced us to the conclusion that death was not produced by the involvement of the nervous system, so much as from poisoning of the system by a ptomaine, or something of that nature. He asked if in Dr. Holt's case the diagnosis had been made before death.

DR. HOLT replied that he had not seen the case during life, but that it had been observed by a competent house physician, and that meningitis had not even been suspected; and, in fact, there were no nervous symptoms present up to twelve hours before death. He recalled one case which had been repeatedly examined by several others besides himself, and no one of the observers suspected meningitis: yet the autopsy showed that, in addition to the meningitis, there was a well-marked lobar pneumonia, which had caused the child's death. This was in striking contrast with the well-known fact that children with pneumonia often had intense cerebral symptoms without meningitis.

DR. BIGGS reported a case bearing upon the relation of the pneumococcus to meningitis. It was one of double lobar pneumonia and meningitis which occurred at Bellevue Hospital, and where cultures from the meningeal exudate showed the presence of the Fraenkel pneumococcus.

DR. LOUIS WALDSTEIN inquired particularly concerning the relation of the pulse, respiration, and temperature in Dr. Holt's case; for, as cerebro-spinal meningitis must be looked upon as an infectious disease, due probably to the circulation of some toxic principle in the blood, he wished to know the effect of this poison upon these vital signs.

Regarding the connection of the child's fall with the case, DR. FISHER believed that it was entirely independent of the subsequent history.

DR. PRUDDEN, on the other hand, thought it might be a very sig-



nificant feature, for two factors must be recognized in the production of an acute infectious disease, *i.e.*, the predisposing and the determining causes. The child's fall might have caused a change in the brain which predisposed it to the lodgment and growth of these germs—a change so slight that it might not have caused any trouble if these germs had not been present.

THE PRESIDENT commented upon the great scientific value of a report of a case which had been so well observed, and said that he thought the relation of the bacterium to the disease was the most important element in the case. The connection of these micrococci with two diseases, cerebro-spinal meningitis and pneumonia, was very curious; for the former usually occurred in epidemics, which were frequently complicated by pneumonia, while the latter was constantly present.

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*Stated Meeting, November 12th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

CEREBELLAR HÆMORRHAGE WITH COMPLETE PARALYSIS ON THE  
SAME SIDE AS THE LESION.

DR. J. S. THACHER presented a specimen showing a hæmorrhage of considerable size in the left cerebellar hemisphere, and a minute lesion in the opposite hemisphere. The patient had suddenly become comatose, and on his recovery a few hours later was found to have paralysis of the left extremities. After about one week without any especial change in the symptoms, he again became comatose, and died. References in medical literature to the occurrence of hemiplegia upon the same side as the lesion in these cases were very vague. Gowers makes the obscure statement that paralysis occurs on the same side, or upon the opposite side, according as the pressure is upon the pons or upon the medulla. Probably the correct inference is that, if the pressure be upon the pons, the paralysis is on the same side as the lesion. Dr. Thacher thought that an explanation might be found in the fact that direct pressure was made by a soft and diffused body, while the counter-pressure upon the beginning of the crus cerebri, on the opposite side, was by the sharp, firm anterior edge of the opening of the tentorium cerebelli. This latter might have a greater effect in producing a lesion of the pyramidal tract.

NECROSIS OF THE TIBIA.

DR. H. P. LOOMIS presented the lower portion of a tibia in which the process of necrosis had resulted in a complete and extensive separation of the old bone, and the development of new bone from the inner layers of the periosteum. The specimen was taken from

a man, about twenty-nine years of age, who had been in perfect health up to about two months previous, when, after a day's work upon his knees, he was seized with severe pain in one knee. After one week pus was evacuated from an opening made into the knee joint, and very soon the lower portion of the leg was riddled with sinuses. Amputation at the knee was performed. The specimen showed that recovery would have been impossible without operative interference.

DR. LOOMIS also presented specimens illustrating

#### PRIMARY TUBERCULOSIS OF THE GENITO-URINARY TRACT.

They were removed from a woman, about forty-five years of age, whose history was unknown. There was considerable pus in the pelves of the kidneys, and some concretions. The bladder showed, in addition to cystitis and thickening of its walls, the usual appearance of tuberculosis of this organ. The cervix and body of the uterus and the vagina showed small ulcerations, which were in all probability tubercular, although stained sections had not shown the presence of tubercle bacilli. The other viscera were normal, with the exception of the heart, which was sufficiently diseased to account for the patient's death.

THE PRESIDENT remarked that he had seen apparent tuberculosis of the uterus, Fallopian tubes, and both kidneys without any involvement of the bladder; tubercular disease of the testicle and kidney was also common enough; yet the course followed by the tubercle bacilli in gaining entrance to the genito-urinary tract was not known.

#### GENERAL TUBERCULOSIS; TUBERCULAR MENINGITIS.

DR. L. EMMETT HOLT presented specimens from a case of tuberculosis in a child four and a half years of age. The family history was negative so far as tuberculosis was concerned. One year ago the first signs of Pott's disease in the lower cervical region were noticed, and deformity had been present for about two months. Five months ago enlargement of the cervical and axillary glands was first noticed. During the past summer, with the exception of frequent headache, she had been in fair condition up to two weeks before death. Then she was suddenly seized with vomiting, the headache became more severe, and there was constipation with moderate fever.

Nine days later she was admitted to the hospital. At this time she was very drowsy, but could be partly roused; slight opisthotonos; cervical and axillary lymphatics enlarged to the size of a hen's egg; and nodular tumors about the size of an almond could be felt along the spine through the abdominal wall. There were localized fine râles at the right apex of the lung; spleen slightly

enlarged. During the next five days the temperature ranged from 100° to 101°; there was occasional vomiting, constipation, steadily increasing drowsiness, and, during the last two days, irregular pulse, irregular respiration, and convulsions, first affecting the left side of the face, then both upper extremities. There was also almost complete left hemiplegia. Pupils were dilated, and there was convergent strabismus. Abdomen was natural until the last twelve hours, when it became greatly distended. Death occurred in convulsions with a temperature of 104.5° F.

At the autopsy the brain was found slightly congested; the pia closely studded with miliary tubercles at the base, along the Sylvian fissures, and particularly over the choroid plexus. Tubercles were also scattered over the convexity, but very little pus or fibrin was to be seen anywhere. The ventricles were not distended. The sinuses contained dark fluid blood. The cord was not examined. The bronchial nodes and all the mediastinal nodes were very greatly enlarged, forming a cluster about the trachea and large bronchi nearly as large as the fist, individual nodes being from one-half to one and a half inches in diameter, and cheesy on section. At the right apex a small area of consolidation, studded with tubercles, the lung rather firmly adherent over this area. In other portions of the lungs there were scattered miliary tubercles; no areas of consolidation and no pleurisy. The heart was normal. The liver was fatty and somewhat adherent to the diaphragm, and a few tubercles were found on its surface and in its substance. The spleen was increased to about twice its normal size, and showed tubercles on its surface only. The kidneys were soft and slightly enlarged, showing throughout a moderate amount of parenchymatous nephritis, and in one a tubercular nodule about the size of a pea, which had broken down. The stomach contained a tarry mucus, and showed many minute follicular ulcers about the size of a pin's head. A few small tuberculous ulcers were found near the ileo-cæcal valve. About the cæcum, vermiform, and sigmoid flexure was a localized plastic peritonitis. The mesenteric and retroperitoneal nodes were everywhere enlarged and cheesy, the average size being one to one and a half inches. The case was one of general tuberculosis involving chiefly the lymphatic system, and followed by a tubercular meningitis.

#### GENERAL TUBERCULOSIS WITH A HISTORY ONLY OF MARASMUS.

DR. HOLT also presented specimens from a child, aged ten months, who had been admitted to hospital four days before death with a history of marasmus since birth. Her weight was six and three-quarter pounds, and during her stay in the hospital there was no temperature, cough, or evidence of any local disease. Physical examination showed the body greatly emaciated, and at the left apex

was a small area of consolidation giving dulness, bronchial breathing, and fine râles. The lungs elsewhere, together with the other organs of the body, were normal. The child died suddenly, having appeared, two hours before death, as well as at any time for the past four days. At the autopsy the examination of the brain and heart was negative. The lungs showed a consolidation involving the greater part of the left upper lobe, and on section the lung showed numerous small cavities communicating with each other. A few large cheesy nodules had not yet broken down. The pleura over the lung was normal. Throughout the lower lobe of the left lung were small reddish nodules as large as a small pea, the centres evidently of infection by aspiration from the disease in the upper lobe. Miliary tubercles were scattered throughout both lungs. The bronchial nodes upon the left side were cheesy, but not broken. There were no ulcers in the small intestine, but a partly cicatrized ulcer was found in the rectum, about four inches from the anus. A few cheesy mesenteric nodes occupied the right iliac fossa. Scattered tubercles were seen upon the surface of the liver, but the spleen only showed two or three on its surface. The kidneys and peritoneum were normal.

#### METALLIC CAST OF BRONCHI.

THE PRESIDENT exhibited a metallic cast showing the ramifications of the bronchi. It was of interest in connection with Dr. Holt's second case, as it showed how easily the tubercular material could be distributed through the lung by aspiration.

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*Stated Meeting, November 26th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

#### MELANOTIC MYELOMA.

DR. CHARLES HEITZMAN presented such a tumor, removed from the right malar region, together with the following history:

A lady, fifty years of age, of healthy appearance, presented herself on November 21st with a dark, nearly black, discoloration of the skin, about one and a half inches in diameter, in this region, reaching to the outer canthus of the eye, and extending downward and outward. The pigmentation appeared mottled, owing to variations in color from gray to nearly black. This spot had developed within the last six years. In its centre was a tumor the size of a split pea, likewise pigmented, of a rather soft consistence. It caused no pain, and had grown within the last six or eight weeks from a minute nodule to its present size. The patient said that the pigmented area had assumed its mottled appearance only since the tumor had begun to grow. The diagnosis was malignant melano-

tic tumor. The tumor was excised with a pair of curved scissors, and the hæmorrhage checked by liquor of iron. To the naked eye the whole tumor appeared of a slate color. After hardening in chromic acid solution, one per cent, it was examined microscopically, and its structure found to be that of a net-celled sarcoma of Virchow. Large, spindle-shaped, mostly nucleated, protoplasmic bodies produce comparatively coarse network by freely anastomosing with one another. Within the spindles are found a moderate amount of dark-brown and gray clusters of pigment of varying sizes. This proves the correctness of the clinical diagnosis. At the same time an extremely unfavorable prognosis must be made, since it is known that wherever such melanotic tumors appear rapid local growth, dissemination in the skin, and secondary formation of myeloma in internal organs are to be expected, in spite of all attempts at eradication. Within two years such cases terminate fatally. Spontaneous involution is extremely rare, and possible only when the pigmentation is diffuse and pigment clusters are lacking.

DR. H. N. HEINEMAN said that perhaps Dr. Heitzman might recall the case of a young man, under twenty-eight years of age, which had been presented to the Society about ten years ago. A tumor caused marked protrusion of the eye, and melano-sarcomatous growths developed in the skin, lungs, brain, and elsewhere, until finally the entire body assumed a dark color. The patient died in less than eighteen months after the original injury. It was interesting to note that the tumor began on the face. In this particular case the choroid might be considered the source of the pigmentation, but this would not explain its origin in tumors situated in other parts of the body, except perhaps those located in the deeper layers of the skin.

Two varieties of pigment have been found, and these two varieties seemed to be at times combined; for, in many instances, the pigmentation of the skin is the primary phenomenon. He had known one gentleman to have black spots on the extremities for years, but finally nodules appeared in other places, and shortly afterward he died. This case would indicate that the pigmentation was a presage of the tumor itself. These pigmented growths far exceeded in malignancy cancer, or even white sarcoma.

In answer to a question from the President, he said that he did not consider the pigmentation to be of blood origin, but formed from the spindle cells. Either the organ in which the tumor grows is pigmented, or else the skin becomes pigmented, as, for instance, in a mole. Such a spot is ordinarily without significance, yet long afterward, if a tumor form here as a result of some slight irritation, melano-sarcoma would probably develop.

THE PRESIDENT said that in one case of this kind which he had



seen, the trouble began in the right parotid region. Four or five times the tumor was excised, and when he last saw the patient there were a number of these growths in the skin of the abdomen, and the liver was greatly increased in size and contained hard, rough masses. All of these tumors which he had examined were melanotic. Within a period of fifteen months the patient had hæmatemesis and other symptoms of malignant disease of the stomach.

DR. C. N. DOWD presented a specimen of

ABSCESS OF THE TEMPORO-SPHENOIDAL LOBE OF THE BRAIN  
SECONDARY TO OTITIS MEDIA.

The specimen is one of abscess of the temporo-sphenoidal lobe of the brain secondary to suppurative otitis media. Since the subject has a clinical as well as a pathological bearing, I wish to compare the condition of the brain and the clinical history, and also to refer to certain other published cases.

*Pathological Condition.*—The brain is of normal size. Dura mater normal in appearance. Pia mater somewhat dull in lustre, especially at the base of the brain. Within the left temporo-sphenoidal lobe there is an abscess about the size of a hen's egg. The abscess had no external opening, but there is a softening and thickening of the pia where it lay on the petrous portion of the temporal bone. There was normal brain tissue, one-half to three-quarters of an inch in thickness, between the pia and the abscess over nearly the entire surface of the lobe.

The walls of the abscess were necrotic and of a dark-green color. It was filled with thin, green-tinted pus. The petrous portion of the temporal bone was broken down and infiltrated with pus.

*Microscopical Examination.*—The walls of the abscess are infiltrated with leucocytes and show much broken-down material. Between the abscess wall and the pia mater there is normal brain tissue. At the lower portion of the lobe the pia shows exudative inflammation, some of the folds in the sulci extending to the areas of inflammation within. Sections taken from the crus cerebri show a similar condition. Those taken from the vertex do not show inflammation.

Sections of the dura mater taken from beneath the left parietal bone are normal.

*Clinical History.*—The patient, a well-nourished boy of ten years, first came under hospital observation August 28th, 1890. When about three years old he had scarlatina. For the last three or four years he had had attacks of earache and otorrhœa from the left ear. Otherwise he had seemed a healthy boy.

He had played about in his usual manner until the day of admission, but for about a week had had attacks of headache and earache, hot and cold sensations, and evening delirium. On the morning

of August 28th he vomited and had frontal headache, and had fever which came on without a chill. When seen on the afternoon of that day he was so prostrated that he could hardly walk, there was marked rigidity of the neck, and he held the head extended. On lying down he quickly flexed his legs and arms, and seemed best content to be left lying in that position. His pupils were equal in size and reacted to light. He had slight nystagmus, no ptosis, no photophobia. No disturbance in sensation or the power of motion was noted. He then showed no tendency to convulsions. P. 72, R. 28, T. 103.8°.

The tympanum of the left ear was perforated, and there was a slight purulent discharge from the ear. There was no tenderness over the mastoid process.

*Physical Examination* of chest and abdomen revealed nothing abnormal.

*Urine*.—Alkaline; 1.016; trace of albumin. Phosphates seen through microscope.

August 29th. Patient delirious all last night; had five general convulsions and several attacks of opisthotonos. This morning he is greatly exhausted, face cyanotic, marked nystagmus. During day rational and took nourishment. In the evening again delirious and very noisy, crying out in shrill voice; confined to bed by force.

August 30th. Patient quieter during latter part of night; no more convulsions or opisthotonos. During day about as he was yesterday. *Ophthalmoscopic Examination* shows no changes in optic discs. Bowels costive, but respond to cathartics. In the evening he was again noisy and delirious.

Until his death, which occurred on the morning of September 3d, he steadily failed. For the last two days he was in a stupor, which deepened to coma. No convulsions, opisthotonos, or nystagmus after the night of August 28th. Slight tenderness over left mastoid process September 1st.

	T.	P.	R.
August 28th, P.M. ....	103.8°	72	28
“ 29th, A.M. ....	103.8°	78	36
“ 30th, “ .....	100.2°	82	28
“ 31st, “ .....	100.2°	68	26
“ “ P.M. ....	101.6°	66	24
September 1st, A.M. ....	102°	72	26
“ “ P.M. ....	102°	70	24
“ 2d, A.M. ....	99.6°	64	24
“ “ P.M. ....	100°	64	24
“ 3d, A.M. ....	98.6°	64	..

It is to be noticed that the temperature showed those sudden and extended variations which are so often present when there is an

accumulation of pus. The pulse was uniformly slow—the typical pulse of meningitis.

*General Considerations.*—One's greatest surprise concerning this case is that so great a lesion should have given rise to so few symptoms. The abscess must have existed for a long time; the necrotic condition of the walls and the character of the pus indicated this.

Yet the boy played about as usual in the daytime until the very time of admission to the hospital. To all appearance he was a healthy, vigorous boy. Until August 20th the only symptoms which pointed to cerebral trouble were the occasional attacks of headache and earache, and the otorrhœa.

While under observation he gave symptoms of meningitis and the constitutional symptoms of an accumulation of pus, but we find no symptoms which pointed definitely to the involvement of a portion of brain tissue.

The location of the abscess prevented marked symptoms from the involvement of cerebral centres. It did not extend to the motor tract and speech centres, nor to those which control sight. The centres for smell and hearing are believed to be in the temporo-sphenoidal lobe, that for smell in the uncinate convolution on the median surface near the apex of the lobe, that for hearing in the posterior half of the highest temporo-sphenoidal convolution. There is no history of the loss of smell in this case; if the centre was involved, the other side of the brain may have assumed the function. The same may be said of the hearing; in fact, we are told to expect the other side to assume the function in such cases.

It is evident that in cerebral abscess we must not expect definite symptoms from the involvement of centres, unless the motor tract is affected. Gowers<sup>1</sup> states that "he is aware of no case in which the indications of cerebral localization have alone guided the operator successfully." Where there has been a traumatism, or where there has been a long-standing inflammation of the middle ear, these conditions would of course increase the importance of local symptoms.

There is one other set of symptoms which may be looked for in such cases: the optic nerve or its sheath may be involved in the inflammation, and choked disc produced; or other cranial nerves or their sheaths may be involved and their action hindered or prevented. In this case there was no evidence of the involvement of any of the cranial nerves.

Hence we have a case in which the local symptoms of abscess were wanting, although the abscess existed.

The course of these abscesses is to come to the surface and cause fatal meningitis, or to break into the ventricles and cause death in

<sup>1</sup> "Diseases of the Nervous System," W. R. Gowers, Am. ed., p. 711.

that way. The probability of their draining through the ear is very remote.

Since the condition is so serious, I have looked over the records of some cases where the symptoms have been more definite and where operation has been resorted to. Von Bergmann<sup>1</sup> has collected eight cases in which the diagnosis was made and the abscess opened. In three of the cases there was recovery. One of them<sup>2</sup> was seen by W. R. Gowers and operated on by A. E. Baker. He had had otorrhœa for about eleven years, acute symptoms for three weeks, with headache and depression and slight double optic neuritis. The mastoid cells were opened, and they and the middle ear were well washed out, the washing sometimes causing nystagmus. In spite of this cleansing of the ear, the fever persisted and the patient had a chill. The diagnosis of cerebral abscess was then made. The optic neuritis, the persistence of the fever after the ear was washed out, the nystagmus caused by the washing, and the long history of otorrhœa, were the main elements in the diagnosis. An opening was made one and one-half inches posterior to the external auditory meatus and one and one-half inches above Reid's base line, a trocar was inserted, and the abscess drained. The patient recovered.

Another case was operated on by Greenfield.<sup>3</sup> A patient who had symptoms of meningitis, and who had otorrhœa from the left ear, developed left optic neuritis and paralysis of the third, fourth, and sixth nerves. The diagnosis was made on the supposition that the involvement of these nerves was due to an inflammation from the meninges which had involved the nerve sheaths and then the nerves themselves, and, considering the otorrhœa, he thought this inflammation due to an abscess of the temporo-sphenoidal lobe which had extended downward. He trephined about one inch above the zygoma and one and one-fourth inches behind the external angular process, drained the abscess, and the patient recovered.

In grouping the symptoms of the eight cases, Von Bergmann states that the patients complained of headache, especially over the affected side, and great pain on percussion there. Nausea and vomiting, and either somnolence or complete loss of consciousness, were constant.

Three cases showed a diminution in the frequency of the pulse.

Three cases showed choked disc, two of them on the affected side, and two of them at last having dilatation of the pupil on the affected side.

Five cases showed symptoms from the involvement of cerebral

<sup>1</sup> Von Bergmann : " Die chirurgische Behandlung von Hirnkrankheiten," zweite Auflage, Berlin, 1889 ; Rev. Schmidt's Jahrbücher, June, 1890.

<sup>2</sup> Brit. Med. Jour., December 11th, 1886, p. 1154.

<sup>3</sup> Brit. Med. Jour., February 12th, 1887, p. 317.

centres; two of them had amnesic aphasia, four paresis of the opposite arm, three facial paresis on side opposite the abscess, one paralysis of third, fourth, and sixth nerves.

In all cases the legs were unaffected.

In looking over these tables, and also in studying two other cases recently reported by Rose and Cheyne,<sup>1</sup> we see that in the few cases where the diagnosis has been made there has been, almost without exception, involvement of the cranial nerves or motor centres. The otorrhoea, the symptoms of meningitis, and the constitutional symptoms of pus have been of importance, but they have been too indefinite to give ground for the diagnosing and locating of the abscess. The indefiniteness of the symptoms in the case we are studying is a remarkably good illustration of the way in which these abscesses may exist for a long time and then terminate fatally without giving any adequate indication of the nature or location of the disease.

We may also remember that, in about one-fourth of the cases of brain abscess due to otitis media, the abscess is not in the temporo-sphenoidal lobe, but in the cerebellum, or pons, or crura cerebri, and this still further increases the difficulties of the subject.

In cases which give indefinite symptoms, the existence of otorrhoea would lead us to think of the possibility of abscess of the brain, nearly one-half of all such abscesses being secondary to otitis media.

When the symptoms are urgent, the opening of the mastoid cells is certainly to be recommended. Where there is no abscess this may relieve the middle ear by giving a free exit to the pus, and thus prevent further extension of the inflammation; where there is an abscess it may furnish ground for the diagnosis by exclusion, as in the case quoted above. It is a simple operation, is easily performed, and is almost without danger to the patient.

DR. HEITZMAN said that it was easy to understand that foci of suppuration might be established by the transmission of staphylococci from other centres of suppuration; but in a case presented to the Society, about sixteen years ago, by Dr. J. Lewis Smith, a child about one year of age was found to have a small abscess lodged in the centre of the left hemisphere in the medullary substance, in the neighborhood of the left ventricle. The abscess finally burst into the left ventricle and the child died.

Those who accept the theory that there is no suppuration without the presence of one or more of the varieties of staphylococcus, believe that these organisms are circulating in the blood, and that when a traumatism occurs the accompanying stasis in the blood vessels causes their lodgment at the seat of injury. It is on this theory that they have endeavored to explain the formation of pus in the very centre of the shafts of bones, as occurs in osteomyelitis.

<sup>1</sup> Archives of Otolaryngology, vol. xix., p. 140.



Others believe, with Strycker, that suppuration is not due to a pouring-out of colorless blood corpuscles, but to the breaking-down of inflamed tissue. If the inflammation become plastic around the abscess, new blood vessels and connective tissue are formed, giving rise to the so-called pyogenic membrane. The migration theory of Cohnheim had lost ground lately in Germany.

DR. J. S. ELY thought, with Dr. Heitzman, that the most interesting pathological question in connection with Dr. Dowd's paper was, how these organisms, to which we must now attribute suppuration, found their way from the middle ear into the interior of the brain, without any evidence of direct extension of the process. We are accustomed to think of three channels of distribution of these organisms through the body, *i.e.*, the arteries, the veins, and the lymphatics. It was well known that there are no arteries or veins passing directly through the dura mater and pia into the brain at the part of the brain already cited as being the seat of the abscess. The nearest artery to the tympanic cavity of any size is the tympanic branch of the internal carotid artery; hence, for a poison to be distributed by it, it would be necessary for it to pass against the blood current to the internal carotid, and thence be distributed by the internal carotid and middle cerebral arteries to the upper portion of the temporal lobe, which is supplied by this artery. The lower portion of this lobe is the more common seat of abscesses, and it derives its blood supply from the posterior cerebral artery behind the posterior communicating artery of the circle of Willis, which connects this artery with the internal carotid. Hence, in order that anything should be carried to the temporo-sphenoidal lobe by the posterior cerebral artery through the tympanic branch, it must pass through the internal carotid artery, and through the posterior communicating branch, which is absurd, as it is against the blood current. For similar reasons, it is out of the question to suppose that extension of the process could take place through the middle meningeal artery; and in the same way the veins can be excluded. We are therefore forced to conclude that the lymphatics are the only possible means of transmission. A fine network of lymphatics perforate the surface of both dura mater and pia, so that it is not difficult to believe that poison might be very readily transmitted through the dura mater into the arachnoid cavity, and that the lymphatics in the pia mater might again take up the poison and transmit it along the vessels through the sulci into the brain substance. This would also explain the frequency with which abscesses occur in the lower portion of the temporo-sphenoidal lobe. It is well known that micro-organisms often pass into deeper tissues without affecting those through which they have passed. In the case cited by Dr. Heitzman, it is quite possible that the circulation might have carried the poison from the middle cerebral artery to the basal ganglia.

THE PRESIDENT said that the lymphatics seemed to be considered a scapegoat for all objectionable things in the human body. The lymphatics were of course an underdrainage system of the body at large; but the direction of the lymph current was not known, and he saw no reason for supposing that the lymphatics on one side of the dura mater should empty micro-organisms into the cerebro-spinal cavity, and the lymphatics on the other side should take them up and dispose of them where they would do most harm. Speaking of the condition of the sense of hearing in these cases of abscess, he would say that in two cases which he had observed the hearing was unimpaired, although in both cases the drum was perforated by large openings and the middle ear was practically destroyed. In a case of otitis media which he had seen two or three years ago in his service at Bellevue Hospital, the patient became stupid, and there was intense pain and tenderness over the left mastoid region. Dr. Hartley operated, but found no disease of the mastoid cells or of the veins. The patient died forty-eight hours afterward, and the autopsy showed that the cerebellum on the affected side was almost entirely destroyed. There was no disease of the temporal lobes.

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*Stated Meeting, December 10th, 1890.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

AZOOSPERMIA.

DR. CHARLES HEITZMAN reported one of these rather rare cases, and exhibited a specimen of the seminal fluid under the microscope. The fluid had come from a German, thirty-three years of age, with the following history: The patient had been a masturbator from his seventeenth to his twenty-seventh year; had had gonorrhœa three times, the first time for six months with accompanying epididymitis on the left side. He was sexually excitable, had a small penis and markedly small testes. No remains of the epididymitis. He had been married two years, and his wife had not been pregnant. Microscopical examination of his semen revealed the following features: A few phosphatic crystals, a few red blood corpuscles, a few so-called testicular elements, a large number of urethral epithelia, a moderate number of globular and oblong corpuscles looking like the heads of spermatozoids, numerous delicate, mostly straight filaments, looking like the débris of spermatozoids, but not a single fully developed spermatozoid. The bulk of the semen was composed of mucus. A second case had come under his observation during the past week, in another German, forty-eight years of age. This man had likewise had gonorrhœa and left-sided epididymitis, the epididymitis being still indurated. The penis and testes

were normal in size. He had been married four years, and his wife was sterile. In this case the seminal fluid appeared crowded with minute fat granules, a few red blood corpuscles, a few so-called testicular elements, and filaments like broken tails of spermatozooids. No phosphatic crystals, no spermatozooids. As to the causation of azoospermia, Dr. Heitzman considers it a congenital disturbance in the formation of spermatozooids, but not as a result of an epididymitis, which affects only the conducting apparatus of the testis. In his opinion, based upon the study of the development of spermatozooids in rats, the filaments arise in the interior of the epithelia of the seminiferous tubules, by a direct transformation of the filaments of living matter held in the epithelia, after a preceding fusion of a row of epithelia into an elongated protoplasmic mass. The portion nearest the tubular wall is changed into heads of spermatozooids, the central portion, on the contrary, being transformed into the tails. Some of the epithelia escape such a transformation, and appear as the so-called testicular elements. Absence of fusion of the tubular epithelia would explain the appearances in azoospermia, where the heads are destitute of tails, and the latter look as if broken up into small, thread-like pieces.

THE PRESIDENT said that this theory, that the fusion of cells produced on the one hand the head and on the other the tail of the spermatozooids, was most interesting, and merited careful consideration and discussion.

#### TUBERCULOSIS LIMITED TO THE BRONCHIAL LYMPH NODES.

DR. W. P. NORTHRUP presented a case of this description. A female child, aged three years, born in the maternity wards of the New York Foundling Asylum, was taken sick with measles, early becoming croupy, giving evidence of its diphtheritic nature in the pharynx, soon requiring intubation, and at last developing pneumonia. After an illness of six days it succumbed, and presented on autopsy these interesting peculiarities, viz., tuberculosis limited to the bronchial lymph nodes. The nature of the process has been substantiated by finding tubercle bacilli in the small and large cheesy masses in the nodes grouped at the bifurcation of the trachea. These opaque white masses were plainly seen at autopsy, the size varying from a millet seed to a pea. No other tubercles could be found anywhere in the body after careful search.

The remaining notes of the autopsy are of no special interest. The child was well nourished; its diphtheritic exudate extended from the tip of the epiglottis to the finest branches of the bronchi. Bronchial nodes, about half a dozen in number, were tuberculous; only two of them, however, were extensively cheesy. The remaining nodes were slightly enlarged, and contained small, discrete masses of varying size. There was extensive recent broncho-pneu-

monia, but no tubercles were in the lungs. This case was unique in his experience. He had long hoped to find this condition, for a large majority of cases had given fairly plain evidence that their oldest tubercular process was in these nodes. He believed that a collection of the cases recorded in the dead-book of the New York Foundling Asylum would give, with this case, an unbroken series illustrative of the theory that by far the largest percentage of cases of general tuberculosis had their earliest infection in the lymph nodes clustered about the root of the lungs.

#### GENERAL TUBERCULOSIS WITH EXTENSIVE NECROSIS OF ONE LUNG.

DR. NORTHRUP also presented specimens from such a case. A male child, aged five months, was returned from the Out-door Department of the New York Foundling Asylum with the diagnosis of pneumonia. In addition to the pulmonary lesion, it had marked intestinal disorder, the two giving a temperature of 103° and 104° F. The diarrhoea and temperature gradually subsided, so that on the fifth day the thermometer registered 101-99.5° F., and on the eighth day 98.5° F. The first notes of the case record that at the right apex in front there were fine râles, bronchial breathing, dulness almost amounting to flatness, with fair resonance. The diagnosis at this time was apex pneumonia with unusual signs. Two weeks later the signs were not yet certain, and, from the extreme dulness, the diagnosis was inclined to favor encapsulated fluid at the anterior upper front of right lung. There was absence of respiratory murmur, marked dulness behind as well as in front; râles in axillary region elicited by coughing, at the same time the resonance below both in front and behind continuing fair. A needle was passed into the region of anterior dulness and brought away a few drops of turbid fluid, which showed under the microscope recent pus cells. This was thought to justify the diagnosis already made of encapsulated empyema, but the quantity of fluid seemed strangely small. Another puncture behind, below the angle of the scapula, brought a few drops of pus, but even less than anteriorly. An operation was not considered advisable, and after about two weeks more without elevation of temperature, and with gradual failure of flesh and strength, the child died. At the autopsy no superficial enlargement of the lymph nodes was found. There was general tuberculosis. The chief point of interest was in the upper lobe of the right lung. In its anterior portion, involving the pleura and fusing it with the costal pleura, was a large tuberculous mass containing a central splanchnic. The latter was lying loose in the cavity opened in removing the lung, was irregularly disc-shaped, one and one-half inches thick, and cheesy, crumbling at its margins. On manipulation the cheesy mass easily came out of its bed, disclosing a cavity with an irregular floor strewn with crumbling cheesy



pieces, with several openings admitting a probe, which found its way out through the larger bronchi to the main bronchus. The remainder of the upper lobe was pneumonic and contained tubercle tissue. The lower lobes of the right lung were somewhat congested. The left lung was normal. The bronchial lymph nodes of the right lung, and right side of trachea at its bifurcation, were enlarged and softened in their centres. One especially large one was situated close against the right apex, resting upon the largest bronchus leading to the cavity. No opening could be detected between them. The cheesy and diffuent glands about the root of the lung were conspicuously near the necrotic area, but there was living tissue between these glands and the cavity containing the sphacelus. This living tissue was densely infiltrated with tubercle tissue, and the vessels and bronchi leading to the cavity passed through the tubercular mass. Within this small sphere was included all the tubercular process, lung and nodes. Which was the older, the lymph nodes or the lung necrosis? The case demonstrates the possibility of tuberculosis developing first in the lymph nodes at the root of the lung. Numerous specimens presented by Dr. Northrup to the Society had made conspicuous the fact that the oldest process may be limited to the nodes, while only the most moderate spreading of the process in the immediate vicinity had taken place. He had presented one specimen showing a tubercular inflammation surrounding and closing up an artery at the base of the brain, with softening and destruction of the region which it supplied. The oldest process was probably in the large cheesy and diffuent nodes. From there the process spread by continuity of tissue to the lung, in which one or more were imbedded. The thick, dense tubercular inflammation involved the vessels supplying the region of the necrosis, shut off the blood supply, and caused death of the mass, resulting in the sphacelus. With this wholesale destruction of tissue, it is easy to believe that bacilli escaped into the general circulation, resulting in the general infection and consequent development of recent, discrete miliary tubercles of the brain, liver, spleen, and kidneys. Numerous specimens presented to the Society had shown cavities, varying in number and size, in children's lungs, but a case like this one had not come under his observation before.

There is a record of a similar abscess of the upper right lobe, involving nearly its entire extent, in a nine-months female child. This child was anæmic and had a slight cough. There was no history of pneumonia. Nine days before death she was taken with measles, and subsequently developed some diarrhea. On autopsy there was extensive pneumonic consolidation, the only aërated portions in both lungs being the middle lobe of the right, and posterior portion of the opposite lower. In addition to the abscess referred to above, there were tubercular, cheesy, enlarged glands at the roots of the



lungs, and tubercles in the liver, spleen, kidneys, mesenteric glands, with tubercular ulcers of the intestines. The tubercles in the organs other than the lungs were few in number and fine.

DR. HEITZMAN said that he had seen such cases of primary tuberculosis in the lymph nodes. He had specimens in his collection from one case in which there was considerable enlargement of the bronchial nodes, which by pressure caused extreme dyspnoea and death.

DR. NORTHRUP remarked that his paper was based upon his own personal experience, and out of about two thousand autopsies this was the first instance in which he had met with this condition. In answer to a question from Dr. Biggs, as to why the condition found in the specimen could not be explained as the result of coagulation necrosis, rather than on the assumption that the arteries were plugged, Dr. Northrup said that he had thought the explanation necessary in order to account for the extensive destruction of tissue without liquefaction.

DR. H. M. BIGGS said that this case was quite in harmony with the observations reported by Dr. H. P. Loomis in regard to the primary involvement of the bronchial lymph nodes. It was not uncommon to find, in adults whose lungs showed no evidence of tuberculosis, cheesy and calcareous bronchial nodes.

THE PRESIDENT said that he would like again to bring distinctly before the Society the question of the direction of the lymph currents, about which nothing definite was known. The answer to this question might enable us to determine the course of the bacilli from the nodes to the lungs. Occasionally cases were found in which there were cheesy tuberculous masses in different parts of the body along with tubercles of the pulmonary pleura, but without any evidence of tuberculosis in the remaining portions of lung. The theories usually advanced to explain the mode of infection of the lung with tuberculosis were exceedingly crude. Dr. Roosevelt had devoted two years of hard work to this subject, and had not found a single instance in which there was definite proof that the tubercle bacilli had been introduced by inhalation and had lodged at any point beyond the main bronchi. We knew nothing definite concerning the manner in which the large majority of cases of pulmonary phthisis were contracted, and there had been absolutely no explanation for the occurrence of pulmonary phthisis in the upper lobes of the lungs in about ninety-five per cent of the cases, whereas in about eighty per cent of cases of pneumonia of the infectious type the lesion was in the lower lobes. There was some evidence pointing toward the digestive tract as a common channel for tubercular infection, and this should direct our attention not so much to the dust we inhaled as to the quality of our food.

DR. NORTHRUP had found that in a very large percentage of cases

of general tuberculosis in children the tuberculous process occurred earliest in the bronchial lymph nodes.

#### ENDOTHELIOMA OF THE PLEURA.

DR. H. M. BIGGS presented specimens of this rare condition. They were removed from a man sixty-six years of age, who, nine years ago, had some pulmonary trouble which was supposed at that time to be tubercular. He recovered from this, but about six or seven months ago his health began to fail without any symptoms of any definite disorder. Two months ago a slight cough developed, and a subsequent examination of the chest showed thickening of the left pleura. One month later a small quantity of fluid was found in that pleural sac. The process was supposed to be tubercular, but no examination of the sputum was made and no fluid withdrawn at that time. During the last ten days of life he failed rapidly, and the fluid quickly increased in the pleural cavity. Sixty-six ounces of bloody serum were removed from the left pleural cavity, but he died very suddenly on the evening of the same day. The autopsy revealed an endothelioma of the pleura. Dr. Biggs had only seen one other instance of this condition, and in that case there was a similar history, except that it was of much longer duration. The pleura in the present case was considerably over one-half an inch in thickness at one or two points, and on section a thick mucoid substance could be scraped from its surface. The process involved the whole left pleura. The right pleura showed old adhesions and cheesy masses with fibres of new formation around it, evidently tubercular, and probably dating back to 1881, when he had the attack of localized pulmonary trouble. The bronchial lymph nodes were also very greatly enlarged. There were a large number of nodules in both lungs, about eight or ten in the liver, and one or two in each of the kidneys. Some frozen sections had been prepared and were exhibited under the microscope. Histologically, the tissue of this growth was composed of irregularly branching, apparently anastomosing tubules filled with large, flat, nucleated cells. The other case to which he had alluded was that of a lawyer of this city, who was admitted to the New York Hospital for what was apparently pleurisy with effusion. The fluid accumulated rapidly after each aspiration, so that he had been aspirated six times before he was discharged from the hospital. It was not thought advisable to continue the tappings, lest the fluid might become purulent. Some months later he came under the speaker's care, suffering from dyspnoea due to effusion in the pleural cavity. The fluid was then hæmorrhagic. He was aspirated from time to time during the next six or eight months, and altogether he was aspirated fourteen times within a period of about two years. Before his death a large mass developed along the free border of the ribs on the left side, and

some fluid accumulated in the peritoneal cavity. The dyspnoea became more severe, and was not even relieved by the removal of the fluid. He died apparently from asphyxia. At the autopsy the pleura was found to be enormously thickened, and a large mass was found attached to the cartilages of the floating ribs on the left side; the whole of the peritoneum was covered with new growths, and the pericardium and right pleura were filled with the same nodules. About half a dozen small growths were also present both in the lungs and in the liver. These growths presented a similar structure to that exhibited in the specimens just presented.

#### TUBERCULAR MENINGITIS FOLLOWING OPERATION FOR OSTEITIS OF THE SHOULDER.

DR. V. P. GIBNEY presented the proximal end of the humerus which had been removed from a boy eleven years of age. He had been admitted to the hospital on October 1st, suffering from dry osteitis of the shoulder. An incision was made anteriorly with the intention of excising the bone. On drilling into the bone a collection of pus was found. The opening was enlarged and curetted thoroughly until all diseased bone was apparently removed and the opening was large enough to admit the index finger. A drainage tube was inserted and antiseptic dressings applied. After about two weeks the tube was withdrawn, and the sinuses continued for a while to discharge slightly. On November 30th, or about six weeks after the operation, tubercular meningitis developed. The boy was attended through this illness by Dr. L. E. Holt, who also made the autopsy. The other specimens were to be presented at some other time. The specimen showed that the cavity which had been entered and drained extended into the joint itself, but the glenoid cavity was almost intact. An interesting question in connection with the case was, "Did the operation precipitate the attack of meningitis?" It had seemed to him that, as the wound had healed so kindly and the patient had recovered from the operation without any bad symptoms, the meningitis developing after this rather long interval could only be considered as a coincidence.

#### TUBERCULAR OSTEITIS OF THE FEMUR.

DR. GIBNEY also presented a specimen illustrating tubercular osteitis of the head of the femur. He had removed it a few days ago from a boy, and the progress of the case since the operation had been satisfactory. This tubercular osteitis had developed when the patient was only four months of age, and a similar disease appeared last fall in the left knee. The specimen was a good illustration of the reparative process. Dr. Gibney referred briefly to another case in which extensive destruction of bone was found at the time of operation, which was performed notwithstanding that there was no grating in the joint.

DR. NORTHRUP said that tubercular meningitis was a frequent occurrence in the course of any chronic joint disease, independent of the question of operation.

THE PRESIDENT thought the specimen showed that the general system had been pretty well excluded from the field of operation, and that it was very improbable that the operation had anything to do with the development of the meningitis.

THE PRESIDENT presented a specimen to demonstrate a method of

#### PRESERVATION OF LUNGS IN AN ELASTIC CONDITION.

The specimen presented was removed on January 11th, 1890, and was therefore nearly a year old. For about two months it had been left without cover or protection of any kind. Subsequently it was kept in a loosely covered jar. It retains very nearly the normal color of a freshly removed lung. It expands and contracts in an apparently normal manner. The vesicular murmur can be plainly heard in it, and on percussion the notes obtained are the same as those obtainable from fresh lungs.

The method of preparation is as follows:

The lung must be removed as soon as possible after death. Of course it must be absolutely free from cuts or tears. The bronchus and blood vessels must be cut as long as possible. Large canulæ are inserted into the bronchus, artery, and vein. The preserving fluids are allowed to flow through the vessels from funnels or irrigating bottles raised about five feet above the specimen. The latter is put into a dish sufficiently deep to permit the fluid entirely to cover it. It should be suspended in this dish so that it does not touch the bottom or sides, that the fluid may everywhere surround it. The dish is then partly filled with the following solution, and the same solution is injected into the artery and vein alternately until it runs out perfectly clear:

Chromic Acid, cryst.....	1 part.
Acetic Acid, U. S. P.....	50 parts.
Alcohol (strong).....	500 “
Water .....	1,500 “

This fluid rapidly exudes from the vessels, and, filling the entire lung, begins to flow out of the bronchus, washing out mucus, etc., at the same time. When the organ is well distended a cloth wet with the same solution is laid over it, so as to prevent any portions which may be above the fluid level in the dish from drying.

The specimen may be left in the solution from one to three days. It is next removed and drained as well as possible by gentle squeezing. An exhaust pump is then attached to the bronchus and as much fluid as possible is sucked out. A one-half-per-cent salt solution is now injected through the vessels, and when this runs nearly

free from the yellow tinge of chromic acid the drainage process is repeated.

The specimen is then suspended in a clean dish, and injected through the vessels with

Carbolic Acid (ninety-five per cent).....	1 part.
Glycerin .....	3 parts.
Water .....	4 “

It must be left in this mixture, covered as before with a cloth, for twenty-four hours. It may seemingly be left indefinitely without injury, but the time mentioned is the shortest permissible.

It is again drained as completely as possible, and is put into another dish containing

Olive or Cottonseed Oil .....	20 parts.
Oil of Bergamot or other essential oil.....	1 part.

The oil is also injected into both blood vessels and bronchus, and a large amount should be used. After some time it will be seen that the glycerin solution seems to be displaced, and it forms a layer in the bottom of this dish.

After a day or two the oil may be removed by alternately inflating and exhausting the lung, and the specimen is then finished.

The process will be seen to be a modification of the old glycerin-carbolic method, well known and often used to preserve anatomical specimens in an elastic condition. The modifications are important, however, and the results far better than any obtained in the old way. The idea of the method is, first, to fix the tissues by the chromic and acetic acid solution, then to introduce the glycerin-carbolic acid, and, finally, to get rid of this and practically to make an “oil-tanned” lung.

The process is rather expensive, but the expense may be lessened by filtering the glycerin-carbolic solution after using, and adding to the filtrate some fresh glycerin and acid. The oil can be decanted after use and filtered through flannel, and can be used again and again.



*Stated Meeting, January 14th, 1891.*

DR. J. WEST ROOSEVELT, PRESIDENT, IN THE CHAIR.

THE LUNG FROM A CASE TREATED BY KOCH'S LYMPH.

DR. H. P. LOOMIS presented a section of a lung which had been removed by Prof. Virchow from a case which had died while under treatment with injections of Prof. Koch's "lymph." The portion of lung from which the section had been taken had been obtained by Dr. C. E. Quimby. The patient was in an advanced stage of phthisis, and had received at the Charité Hospital a number of large injections of Koch's fluid. No history of the case could be obtained. From the conditions presented at the autopsy it was hardly right to assume that these injections were the direct cause of death. The section which Dr. Loomis presented was taken from the upper lobe of the lung, and included a portion of the pleura, with an old tubercular nodule situated beneath it. The air cells surrounding this nodule were seen to be the seat of an intense catarrhal pneumonia, and large epithelial cells with a few pus cells almost completely filled the alveolar spaces. Many of the air cells near the edge of the specimen were filled with granular matter, presumably derived from degenerated blood corpuscles, for the capillaries throughout the specimen were intensely congested, and in a few of the alveoli red blood corpuscles were to be seen. The terminal bronchi in the section presented evidences of an extensive bronchitis. The pleura was thickened, and the old and new capillaries in it were packed with red blood corpuscles. No foci of softening nor eruption of fresh tubercles were seen. A section of the lung stained with fuchsin and Bismarck brown showed tubercle bacilli in the centre and about the periphery of the tubercular nodule. The nodule itself was unaltered, and showed the characteristic appearances of an old tubercular process. Such intense congestion and so acute a pneumonia were suggestive features in the specimen.

STRUCTURE OF PUS CORPUSCLES.

DR. CHARLES HEITZMAN exhibited under the microscope pus corpuscles showing the reticulum of living matter, and also showed a photograph, taken by Strycker with the electric microscope, showing this structure.

DERMOID CYST OF THE OVARY.

DR. G. C. FREEBORN presented one-half of a dermoid cyst that had been removed by laparotomy from a woman thirty years of

age. The cyst was of an ovoid shape, measuring twenty-five by twenty-one centimetres in circumference. Its walls are thin and its lumen is filled with a whitish, oily mass and long hairs. On removing the contents from one-half of the cyst, the internal surface of the wall was found to be perfectly smooth, and upon microscopical examination it was found to be composed of fibrillar connective

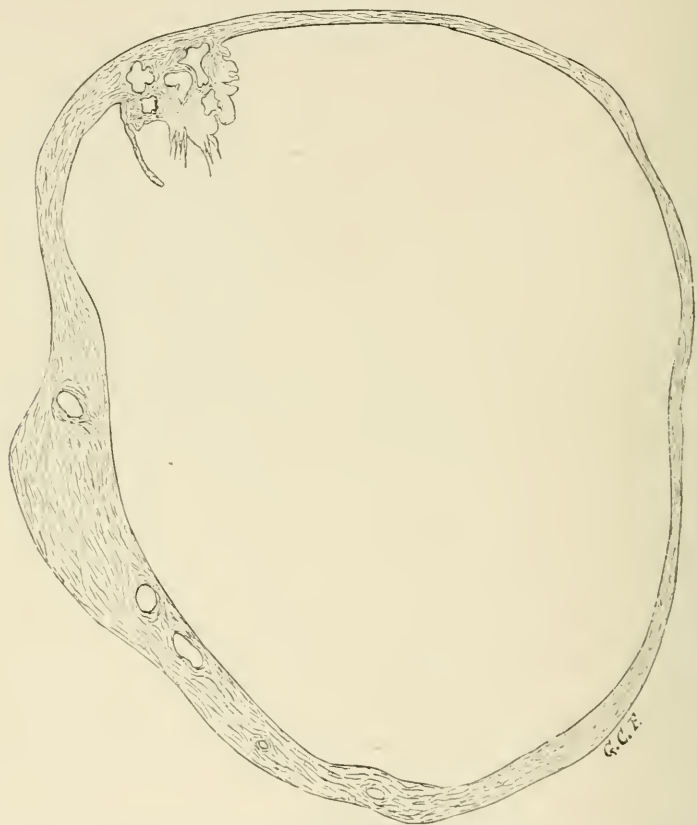


FIG. 10.—SECTION THROUGH THE ENTIRE CYST, SHOWING ATTACHMENT OF THE PAPILLARY MASS.

tissue. This led to the examination of the other half, and upon removing its contents a small papillary mass (Fig. 10) was found attached to the wall and projecting into the lumen of the cyst. Microscopical examination of this mass showed it to be a bit of modified skin. Its base (Fig. 11) resembles normal subcutaneous tissue, containing lobules of fat, sweat glands, nerves, and blood



FIG. 11.—SECTION FROM THE BASE OF THE PAPILLARY MASS.

vessels. Its apex is enclosed by a well-marked layer of epidermis (Fig. 12), from which the cells are being desquamated in large quantities. The dermic layer consists of moderately coarse connective tissue, and is without papillæ. The bulk of this portion of the mass is made up of sebaceous glands.

The tumor was first noticed by the patient six years ago, and has grown very slowly since. It seems probable that the present size of



FIG. 12.—SECTION FROM THE APEX OF THE PAPILLARY MASS.

the tumor is due to the gradual dilatation of the original small cyst by the accumulation of the products of secretion of the bit of skin.

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The following officers were elected for the year 1891:

*President.*—H. M. BIGGS.

*Vice-President.*—H. P. LOOMIS.

*Treasurer.*—J. H. HINTON.

*Secretary.*—O. C. LUDLOW.

*Editor.*—G. C. FREEBORN.

*Committee on Admissions and Ethics.*—R. H. SAYRE, J. H. LINSLEY, J. S. ELY, H. D. STEARNS, H. J. BOLDT.

*Committee on Publication.*—T. M. PRUDDEN, W. P. NORTH-RUP.

*Committee on Microscopy.*—E. HODENPYL, J. S. LINSLEY, H. D. STEARNS.

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